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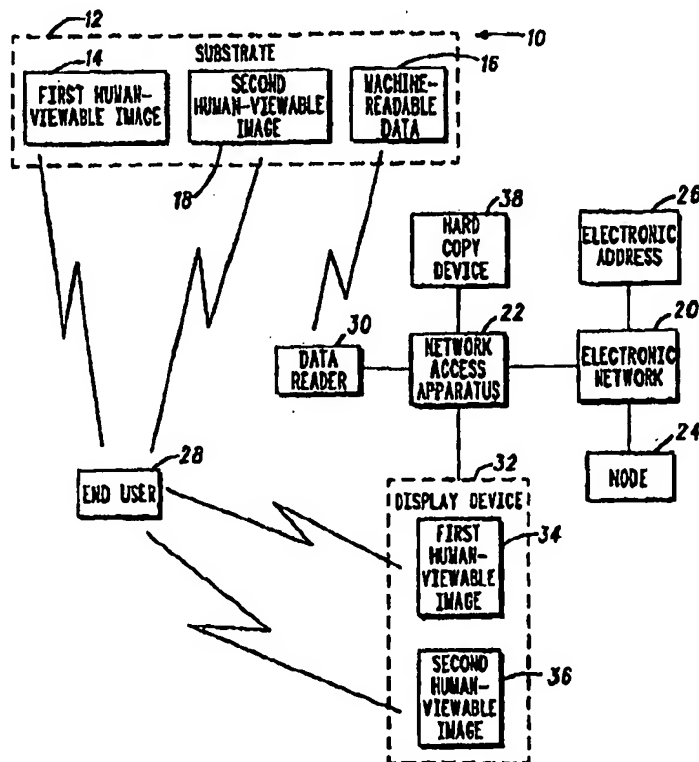
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(21) International Application Number: <b>PCT/US97/19606</b> (22) International Filing Date: <b>4 November 1997 (04.11.97)</b> (30) Priority Data: <b>08/744,338</b> <b>7 November 1996 (07.11.96)</b> <b>US</b> (71) Applicant (for all designated States except US): <b>MOTOROLA INC. [US/US]; 1303 East Algonquin Road, Schaumburg, IL 60196 (US).</b> (72) Inventors; and (75) Inventors/Applicants (for US only): <b>REBER, William, L. [US/US]; 1029 Bucaneer Road, Schaumburg, IL 60916 (US). PERTTUNEN, Cary, D. [US/US]; 11764 Raintree Court, Shelby Township, MI 48315 (US).</b> (74) Agents: <b>TOLER, Jeffrey, G. et al.; Motorola Inc., Intellectual Property Dept., 1303 East Algonquin Road, Schaumburg, IL 60196 (US).</b>			(81) Designated States: <b>AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</b>  <b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: **METHOD, SYSTEM, AND ARTICLE OF MANUFACTURE FOR PRODUCING A NETWORK NAVIGATION DEVICE**

(57) Abstract

A method of producing a network navigation device which includes writing machine-readable data (16) to a substrate (12), and writing a human-viewable image (14) to the substrate (12). The machine-readable data (16) provides an instruction for linking to a resource in an electronic network (20). The human-viewable image (14) is associated with the resource.



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0 METHOD, SYSTEM, AND ARTICLE OF MANUFACTURE  
FOR PRODUCING A NETWORK NAVIGATION DEVICE

Background of the Invention

5 The introductory chapter of Discover the World  
Wide Web with Your Sportster, Second Edition,  
provides a commentary on the present state of the  
Internet and the World Wide Web. In this  
reference, it is stated that the Internet is in  
10 need of an application which will transform the  
"much-hyped but difficult-to-use linking of  
computers around the world to being a highly  
informative, highly usable database and  
communications tool." It is further stated that  
15 the various available Web browsers (e.g. Mosaic  
and Netscape Navigator) all have difficulties and  
limitations which make them insufficient to handle  
the complexity of the Internet.

Part of the problem is in the complexity of  
20 addressing a resource on the World Wide Web. The  
World Wide Web uses an addressing system known as  
a URL (Uniform Resource Locator) that defines the  
location of a resource on the Internet. URLs are  
comprised of up to four parts: a protocol, a  
25 domain name, a path, and a filename. The  
combination of these four parts can produce a  
complex address for a resource. For example, the  
address for information on two-way pagers on the  
Motorola home page is:

30 [http://www.mot.com/MIMS/MSPG/Products](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/desc.html)  
[/Two-way/tango/desc.html](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/desc.html).

Another part of the problem is in the rapid  
increase of the number of entities and the number  
of resources on the World Wide Web. Many entities

0 are finding that domain names which they desire  
are already reserved. As a result, some entities  
have to purchase their desired domain name from  
another holder, or have to reserve a less than  
desirable domain name. Further, as the number of  
5 resources increases, newly-formed URLs become less  
intuitive and greater in length.

Resolving the problem of address complexity is  
important as various companies propose Internet  
navigation systems for the masses.

10 Accordingly, there is a need for an improved  
device for navigating in an electronic network.

#### Brief Description of the Drawings

15 The invention is pointed out with  
particularity in the appended claims. However,  
other features of the invention may become more  
apparent and the invention may be best understood  
by referring to the following detailed description  
20 in conjunction with the accompanying drawings in  
which:

FIG. 1 is a block diagram of an embodiment of  
a network navigation device in accordance with the  
present invention;

25 FIG. 2 is a flow chart of an embodiment of a  
method of producing a network navigation device in  
accordance with the present invention;

FIG. 3 is an illustration of a first network  
navigation device generated in accordance with an  
30 embodiment of the present invention;

0           FIG. 4 is an illustration of a second network navigation device generated in accordance with an embodiment of the present invention;

5           FIG. 5 is an illustration of one surface of a third network navigation device generated in accordance with an embodiment of the present invention;

          FIG. 6 is an illustration of an opposing surface of the third network navigation device;

10          FIG. 7 illustrates a fourth network navigation device generated in accordance with an embodiment of the present invention;

          FIG. 8 illustrates a fifth network navigation device generated in accordance with an embodiment of the present invention;

15          FIG. 9 illustrates a sixth network navigation device generated in accordance with an embodiment of the present invention;

20          FIG. 10 is a general diagram that illustrates an example of a network access apparatus and examples of various data readers for reading machine-readable data from a network navigation device;

25          FIG. 11 is a flow chart of an embodiment of a method of linking to a resource in an electronic network;

          FIG. 12 illustrates an example display of content of a resource using the network navigation device of FIG. 3;

30          FIG. 13 illustrates an example of a step of receiving a user-initiated event associated with a print request;

0           FIG. 14 illustrates an example of a hard copy output produced in response to receiving a print command;

5           FIG. 15 is a flow chart of an embodiment of a method of producing a network navigation device based on a browsing history of the end user;

          FIG. 16 is an illustration of a first embodiment of a network navigation device for a plurality of resources;

10          FIG. 17 is an illustration of a second embodiment of a network navigation device for a plurality of resources;

          FIG. 18 is an illustration of a third embodiment of a network navigation device for a plurality of resources;

15          FIG. 19 is a flow chart of an embodiment of a method of producing a network navigation device;

          FIG. 20 is a block diagram of an embodiment of a system for producing a network navigation device;

20          FIG. 21 illustrates an embodiment of a substrate for use in forming a network navigation device;

          FIG. 22 is an illustration of the substrate of FIG. 21 in a first partially-folded state;

25          FIG. 23 is an illustration of the substrate of FIG. 21 in a second partially-folded state;

          FIG. 24 is an illustration of the substrate of FIG. 21 in a third partially-folded state; and

30          FIG. 25 is an illustration of the substrate of FIG. 21 in a completely-folded state.

0 Detailed Description of the Preferred Embodiments

Embodiments of the present invention advantageously provide methods and systems for producing a network navigation device for  
5 automatically linking a user to a resource in an electronic network. One such device includes a human-viewable image associated with the resource and machine-readable data for navigating to the resource. A user may access the resource by  
10 having machine-readable data read using a data reader rather than by typing an electronic address. As a result, the addressing format and the address itself become more transparent to the user. Consequently, the problem of address  
15 complexity and the criticality of reserving desired domain names is reduced.

Additionally, methods and systems are provided for an end user or for an automated service to produce network navigation devices. The methods  
20 can be advantageously utilized by the end user within a document browser software program, a word processor program, or a desktop publishing program, for example. The systems and the methods for producing the network navigation device are  
25 well-suited for utilization by the masses to navigate to desired sites on the Internet and the World Wide Web.

FIG. 1 is a block diagram of a network navigation device 10 in accordance with a  
30 particular embodiment of the present invention. The network navigation device 10 comprises a

0        substrate 12, a first human-viewable image 14  
supported by the substrate 12, and machine-  
readable data 16 supported by the substrate 12.  
Optionally, the network navigation device further  
comprises a second human-viewable image 18  
5        supported by the substrate 12.

      The first human-viewable image 14 is  
preferably indicative of a resource in an  
electronic network 20. The second human-viewable  
image 18 may preferably indicate any combination  
10       of: a client routine (e.g. an Internet or intranet  
browser routine) which is utilized to display the  
resource, a service provider (e.g. an Internet  
service provider) which connects a network access  
apparatus 22 to the electronic network 20, a  
15       service which provides the resource to a network  
access apparatus 22 via the electronic network 20,  
or an advertiser.

      Optionally, a node 24 in the electronic  
network 20 is used to provide the resource to an  
20       end user 28. Here, the resource can be locally  
present at the node 24 or can be at another  
electronic address 26 in the electronic network  
20. Further, the node 24 can include a mirror  
server to provide resources found elsewhere on the  
25       electronic network 20.

      Although embodiments of the present invention  
can be advantageously utilized for any electronic  
network having an electronic addressing scheme for  
identifying servers and information contained  
30       therein, of particular interest are embodiments of  
the present invention where the electronic network



0        20 includes the Internet, the World Wide Web, or  
an intranet. In this case, the machine-readable  
data 16 can include an electronic address to  
identify the resource, such as at least a portion  
of a URL or an IP (Internet Protocol) address.  
5        Alternatively, the machine-readable data 16 can  
include a code from which the node 24 identifies  
the resource.

It is noted that a URL can includes up to four  
parts: a protocol, a domain name, a path, and a  
10        filename. URL protocols include: "file:" for  
accessing a file stored on a local storage medium;  
"ftp:" for accessing a file from an FTP (file  
transfer protocol) server; "http:" for accessing  
an HTML (hypertext marking language) document;  
15        "gopher:" for accessing a Gopher server; "mailto:"  
for sending an e-mail message; "news:" for linking  
to a Usenet newsgroup; "telnet": for opening a  
telnet session; and "wais:" for accessing a WAIS  
server. Consequently, network navigation devices  
20        in accordance with the present invention can be  
utilized for initiating any of the above tasks.

The first human-viewable image 14 can include  
textual information and/or graphical information  
which preferably provides an intuitive and/or  
25        understandable representation of the resource. As  
an example, to provide a network navigation device  
for the Motorola Web page on two-way pagers, the  
human-viewable image 14 can include textual  
information such as "Motorola" and/or "Two-Way  
30        Pagers", graphical information such as an image or  
an illustration of a Motorola two-way pager, or a

0 combination of textual information and graphical  
information. Such a human-viewable image is more  
intuitive and more understandable to the end user  
28 than an electronic address having the form of  
[http://www.mot.com/MIMS/MSPG/](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/desc.html)  
5 [Products/Two-way/tango/desc.html](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/desc.html).

The second human-viewable image 18 can include  
textual information and/or graphical information,  
such as information which indicates to the end  
user 28 a service (e.g. a node service, a service  
10 provider, a client routine, and/or an advertiser)  
which is providing the resource. For example, the  
second human-viewable image 18 can include textual  
information such as "Brought to you by" and the  
name of the service, graphical information such as  
15 a logo for the service, or a combination of  
textual information and graphical information.

The machine-readable data 16 is communicated  
to the network access apparatus 22 by a data  
reader 30. The form of the data reader 30 is  
20 dependent upon the form of the machine-readable  
data 16. For printed data, the data reader 30 can  
include an optical imaging reader such as a  
scanning wand, a linear CCD (charge coupled  
device) reader, or a two-dimensional CCD reader.  
25 For magnetically-stored data the data reader 30  
can include a magnetic read head, such as those  
within a magnetic stripe reader. For  
electronically-stored data, the data reader 30 can  
include a suitable electronic interface or a  
30 receiver.

0           If desired, the machine-readable data 16 can  
be selected to be readable by more than one type  
of data reader. For example, printed data can be  
printed with a magnetic substance, such as  
5           magnetic ink, so as to be readable by both an  
optical reader and a magnetic reader.

          Generally, the machine-readable data 16 can  
include instructions which direct the network  
access apparatus 22 to execute any combination of:  
a predetermined client routine (e.g. a  
10          predetermined Internet browser routine), a  
predetermined network provider access routine  
(e.g. dialing and logging on to a predetermined  
service provider), and navigation instructions for  
15          automatically linking the network access apparatus  
22 to the electronic address 26 via the electronic  
network 20.

          The network access apparatus 22 can have a  
variety of forms, including but not limited to, a  
general purpose computer, a network computer, a  
20          network television, an internet television, a  
portable wireless device, a television receiver, a  
game player, a video recorder, and an audio  
component. A display device 32, such as a monitor  
or a television, is coupled to the network access  
25          apparatus 22 to display visual content of the  
resource upon linking to the electronic address  
20. To reinforce the association between the  
network navigation device 10 and the resource, a  
first image 34 viewable on the display device 32  
30          upon linking to the resource may be similar to (or  
can be equivalent to) at least a portion of the

0 first human-viewable image 14. To reinforce the  
association between the network navigation device  
10 and the service which provides the resource, a  
second image 36 viewable on the display device 32  
may be similar to (or can be equivalent to) at  
5 least a portion of the second human-viewable image  
18.

The network access apparatus 22 can  
communicate with a hard copy device 38 to provide  
a hard copy representation of an experience  
10 provided by the network navigation device 10. The  
hard copy device 38 can have a variety of forms,  
including but not limited to, a printer, a laser  
printer, an ink jet printer, a thermal printer, a  
plotter, and a fax machine.

15 The hard copy representation allows the end  
user 28 to retrace an experience or navigation  
session initiated by the network navigation device  
10. The hard copy representation can include at  
least a portion of the content from one or more  
20 resources of the electronic network 20 accessed  
during the experience. For example, the hard copy  
representation can include a plurality of images  
in a gallery form which summarize the experience.  
Alternatively, or in addition thereto, the hard  
25 copy representation can include a map which  
summarizes the electronic addresses visited during  
the experience.

If desired, the hard copy device 38 can print  
the hard copy representation onto the substrate  
30 12, or onto another substrate which can be  
attached to the substrate 12. As a result, a

0       souvenir of the navigation session is physically  
linked to the network navigation device 10 which  
initiated the navigation session.

5       FIG. 2 is a flow chart of an embodiment of a  
method of producing a network navigation device in  
accordance with the present invention. As  
indicated by block 40, the method includes a step  
of providing a substrate, such as the substrate 12  
in FIG. 1.

10       Preferably, the substrate 12 is formed by a  
substantially flat piece of material. Examples of  
materials which can be utilized to form the  
substrate 12 include, but are not limited to,  
dielectric materials such as paper, cardboard, and  
plastic, and substantially nonmagnetic materials.  
15       If desired, the material and its thickness can be  
selected so that the substrate 12 is stiff, yet  
flexible. It is noted that, in general, the  
substrate 12 need not be homogeneous, i.e. more  
than two materials can be utilized to form the  
20       substrate 12.

It is also preferred that the substrate 12 be  
shaped and sized to facilitate ease in handling by  
individuals, such as the end user 28. For this  
purpose, the substrate 12 can be card-shaped.  
25       Here, for example, the substrate 12 can have the  
size of a business card, a credit card, an index  
card, a trading card (e.g. a baseball card), or a  
playing card (e.g. from a deck of playing cards).

30       In other embodiments, the substrate 12 is  
shaped and sized as a sheet or a page. Here, the  
substrate 12 can comprise a standard-sized or a

0 custom-sized sheet of printing material. Examples  
include, but are not limited to, letter-sized  
paper, legal-sized paper, A4-sized paper, and  
11x17 inch paper. The substrate 12 can include a  
5 page in a book, a magazine, a newspaper, or other  
printed publication.

It is noted that the substrate 12 can be  
folded or attached to a page which is folded. As  
a result, the network navigation device 10 can  
assume two profiles: (i) an unfolded profile which  
10 provides surface areas for supporting all of the  
machine-readable data 16, the human-viewable  
images 14 and 18, and additional information; and  
(ii) a smaller, folded profile which provides  
smaller externally-accessible surfaces for  
15 supporting a subset of the above-described  
information.

It is noted that embodiments of the present  
invention are not limited to the above-described  
shapes and sizes of the substrate 12. In general,  
20 the substrate 12 can have various shapes, such as  
rectangular, circular, oval, or polygonal shapes,  
and can have various sizes.

As indicated by block 42, the method includes  
a step of writing machine-readable data to the  
25 substrate. The machine-readable data, such as the  
machine-readable data 16 shown in FIG. 1, provides  
an instruction for linking to a resource in an  
electronic network. The machine-readable data 16  
can include any combination of: an instruction for  
30 directing a connection to a service provider to  
access the electronic network, a navigation

0 instruction for linking to the resource, and an  
instruction for selecting a client routine to  
display the content of the resource.

The step of writing the machine-readable data  
16 to the substrate 12 can be performed in a  
5 variety of ways. In some embodiments, the step of  
writing the machine-readable data includes  
printing the machine-readable data 16. The  
machine-readable data 16 can be printed directly  
onto the substrate 12, printed onto a second  
10 substrate for affixing or adhering to a surface of  
the substrate 12, or can be printed to a member  
contained within the substrate 12. In these  
embodiments, the machine-readable data 16 can  
include a bar code, such as a one-dimensional or a  
15 two-dimensional bar code, representative of the  
navigation instructions. Examples of one-  
dimensional bar codes include, but are not limited  
to, 3 of 9, UPC-A, Code 128, Codabar, MSI,  
Extended 3 of 9, Code 93, Extended Code 93,  
20 Industrial 2 of 5, Standard 2 of 5, Code 11, and  
UCC/EAN-128. Examples of two-dimensional bar  
codes include, but are not limited to, Data Matrix  
and PDF417.

Typically, the printed form of the machine-  
25 readable data 16 is not readily interpretable or  
not readily discernible by the end user 28. For  
example, although a human may be specially trained  
to mentally decode a bar code, such a code is  
practically indiscernible by most humans.  
30 Further, the machine-readable data 16 can be

0           printed to be either visible or invisible to the  
            end user 28.

            In other embodiments, the step of writing the  
            machine-readable data 16 includes writing the  
            machine-readable data 16 to a magnetic storage  
5           medium. This step can be performed by: (i)  
            magnetically writing the machine-readable data 16  
            to a portion of the substrate 12 having a magnetic  
            storage medium; (ii) magnetically writing the  
            machine-readable data 16 to a magnetic storage  
10           medium for affixing to the substrate 12; or (iii)  
            magnetically writing the machine-readable data to  
            a magnetic storage medium contained (e.g.  
            sandwiched) within the substrate 12. Here, the  
            machine-readable data 16 can be written to the  
15           magnetic storage medium using a magnetic write  
            head or the like.

            In further embodiments, the step of writing  
            the machine-readable data 16 includes writing the  
            machine-readable data 16 to a memory supported by  
20           the substrate 12. The machine-readable data 16 is  
            communicated to the memory either via an interface  
            integrated with the network navigation device, or  
            via a receiver integrated with the network  
            navigation device.

25           As indicated by block 44, the method further  
            includes a step of writing the first human-  
            viewable image 14 to the substrate. The first  
            human-viewable image 14 is associated with and  
            preferably indicative of the resource.

30           The first human-viewable image 14 can be  
            written to the substrate 12 in a variety of ways.



0        In one embodiment, the first human-viewable images  
14 is printed directly onto the substrate 12. In  
another embodiment, the first human-viewable  
images 14 is printed onto a second substrate for  
affixing or adhering to a surface of the substrate  
5        12. Here, for example, the second substrate can  
have an adhesive backing for affixing the first  
human-viewable image 14 to the substrate 12. As  
another alternative, the first human-viewable  
image 14 can be printed to a member which is  
10        contained (e.g. sandwiched) within the substrate  
12.

As indicated by block 46, the method  
optionally includes the step of writing a second  
human-viewable image to the substrate. The second  
15        human-viewable image can be associated with a  
service provider used to access the electronic  
network, a client routine used to display the  
content of the resource, a node used to link to  
the resource, and/or an advertiser.

20        As indicated by block 48, the method  
optionally includes a step of writing second  
machine-readable data to the substrate. The  
second machine-readable data provides an  
instruction for linking to a second resource  
25        associated with the second human-viewable image.

FIGS. 3 to 9 illustrate various examples of  
embodiments of the network navigation device 10  
produced using embodiments of the method described  
with reference to FIG. 2. It is noted that the  
30        teachings herein can be interchanged and combined

0 among the various examples to form additional  
embodiments.

FIG. 3 is an illustration of a first network  
navigation device generated in accordance with an  
embodiment of the present invention. The network  
5 navigation device includes a substrate 50 which  
supports a first human-viewable image 52, a second  
human-viewable image 54, and machine-readable data  
56.

The first human-viewable image 52 includes  
10 information which indicates to an end user that  
the network navigation device can be utilized to  
link to a resource from or about Motorola, Inc.  
For this purpose, included in the human-viewable  
image 52 is textual information such as  
15 "Motorola", the "What you never thought possible"  
trademark, and graphical information such as the  
Motorola logo 58.

The second human-viewable image 54 includes a  
logo which identifies a service which provides the  
20 resource to the end user. In this embodiment, the  
logo identifies a linking service provided at a  
node (such as the node 24 in FIG. 1) on the World  
Wide Web.

The machine-readable data 56 includes a bar  
25 code representation of a first URL for the node  
which provides the linking service (in particular,  
<http://link.node/>), and a second URL for the  
Motorola home page on the World Wide Web (in  
particular, <http://mot.com>). It is noted that the  
30 URL of <http://link.node/> is a fictitious URL, and  
is utilized for purposes of illustration only. If

0           desired, a printed, human-viewable representation  
59 of any of the machine-readable data 56 can be  
supported by the substrate 50.

          The first URL provides a navigation  
instruction for automatically linking the network  
5       access apparatus 22 to the node 24 via the  
electronic network 20. The second URL is utilized  
to link the node 24 to the Motorola home page (for  
example, at the electronic address 26) via the  
electronic network 20. The node 24 receives  
10       content from the Motorola home page upon linking  
thereto. The content is transferred from the node  
24 to the network access apparatus 22 via the  
electronic network 20.

          Optionally, the content delivered to the  
15       network access apparatus 22 can be modified at the  
node 24 to include an image corresponding to at  
least a portion of the second human-viewable image  
54. Here, for example, the content can be  
modified to include an image of the logo for the  
20       linking service.

          In the embodiment illustrated in FIG. 3, the  
substrate 50 has the size of a business card (3.5  
inches by 2 inches). Preferably, the substrate 50  
is formed entirely of a dielectric and/or  
25       nonmagnetic material such as paper, cardboard, or  
plastic. These materials are advantageous for  
producing a network navigation device which is  
inexpensive, and hence, can be disposed after use.

          The human-viewable images 52 and 54 and the  
30       machine-readable data 56 can be printed directly  
onto the substrate 50. Alternatively, the human-

0 viewable images 52 and 54 and the machine-readable  
data 56 can be printed onto a second substrate,  
which is thereafter affixed to the substrate 50.

5 FIG. 4 is an illustration of a second network  
navigation device generated in accordance with an  
embodiment of the present invention. The second  
network navigation device includes a substrate 60  
which supports a human-viewable image 62 to  
10 indicate to an end user that the network  
navigation device can be utilized to link to a  
resource from or about Motorola, Inc. The  
substrate 60 further supports machine-readable  
data 64 in the form of a first bar code  
representation 66 and a second bar code  
15 representation 68 of a URL for the Motorola home  
page (in particular, <http://mot.com>).

The first bar code representation 66 and the  
second bar code representation 68 are disposed on  
different halves of the substrate 60. Preferably,  
the first bar code representation 66 is aligned  
20 with and located proximate to a first edge 70 of  
the substrate 60, while the second bar code  
representation 68 is aligned with and located  
proximate to a second edge 72 of the substrate 60.

As a result, the end user can grasp the  
25 network navigation device from either of two sides  
without obstructing at least one of the first bar  
code representation 66 and the second bar code  
representation 68. Further, by disposing the  
human-viewable image 62 in a natural viewing  
30 orientation on the substrate 60, the end user can  
view an indication of the resource while grasping

0 the network navigation device from either of the  
two sides. Hence, this embodiment of the network  
navigation device is amenable for both right-  
handed and left-handed use by the end user.

5 In the embodiment illustrated in FIG. 4, the  
substrate 60 has the size of a playing card (2.5  
inches by 3.5 inches). The substrate 60 is  
preferably formed of a dielectric material and/or  
a nonmagnetic material such as paper, cardboard,  
or plastic.

10 FIG. 5 is an illustration of one surface of a  
third embodiment of a network navigation device  
generated in accordance with an embodiment the  
present invention. The third network navigation  
device includes a substrate 80 which supports a  
15 human-viewable image 82 indicating that the third  
network navigation device can be utilized to link  
to a resource from or about Motorola, Inc. The  
substrate 80 further supports machine-readable  
data 84 in the form of a first bar code  
20 representation 86 of a URL for the Motorola home  
page (in particular, <http://mot.com>). The first  
bar code representation 86 is aligned with and  
located proximate to an edge 88 of the substrate  
80.

25 FIG. 6 is an illustration of an opposing  
surface of the third network navigation device.  
At the opposing surface, the substrate 80 supports  
a human-viewable image 90 which, preferably, is  
the same as the human-viewable image 82. The  
30 substrate 80 further supports machine-readable  
data 92 in the form of a second bar code

0 representation 94 of the URL for the Motorola home  
page. Preferably, the first bar code  
representation 86 and the second bar code  
representation 94 are identical. The second bar  
code representation 94 is aligned with and located  
5 proximate to the edge 88 of the substrate 80.

As a result, the end user can grasp the  
network navigation device of FIGS. 5 and 6 from a  
side 96 without obstructing at least one of the  
first bar code representation 86 and the second  
10 bar code representation 94. Hence, the third  
network navigation device is amenable for both  
right-handed use, using one surface, and left-  
handed use, using the opposing surface.

In the embodiment illustrated in FIGS. 5 and  
15 6, the substrate 80 has the size of a playing card  
(2.5 inches by 3.5 inches). The substrate 80 is  
preferably formed of a dielectric material and/or  
a nonmagnetic material such as paper, cardboard,  
or plastic.

20 The use of a printed image and printed data on  
a paper, cardboard or plastic substrate, such as  
in FIGS. 3 to 6, provides a number of advantages.  
A first advantage is that the resulting network  
navigation device can be produced inexpensively  
25 for wide distribution. For example, these network  
navigation devices can be: (i) included as inserts  
in magazines, newspapers, or other publications;  
(ii) stacked into decks and packaged for  
distribution by mail or for marketing in stores;  
30 and/or (iii) distributed as one distributes  
business cards. A second advantage is that a user

0        can rapidly thumb through a number of network  
navigation devices to find network resources of  
interest by viewing the image on each network  
navigation device. In addition, the network  
5        navigation devices can be collected and traded in  
a manner similar to trading cards.

In addition, the use of a printed image and  
printed data allows for network navigation devices  
to be formed on pages of a book, magazine,  
newspaper, or other publication. In general, each  
10        page can define a single network navigation  
device, or can define a plurality of network  
navigation devices. If desired, a page defining a  
plurality of network navigation devices can be  
perforated to allow for separation into individual  
15        network navigation devices.

In one application, the printed image can  
include a figure in a book or the like. Here, the  
printed data may be utilized to link a user to a  
resource having information associated with the  
20        figure. If desired, the printed data can be  
included in a caption for the figure. In another  
application, a plurality of pages of network  
navigation devices are assembled to form a  
directory of resources in an electronic network.

25        Further, the use of a printed image and  
printed data allows for network navigation devices  
to be formed on packages, boxes, containers, and  
the like. Here, for example, a network navigation  
can be formed on a surface of a cereal box.

30        Although the embodiments of FIGS. 3 to 6  
illustrate a single printed code on the network

0 navigation device, it is noted that separate  
printed codes can be utilized for each of the  
various types of information stored on a network  
navigation device.

5 FIG. 7 illustrates a fourth network navigation  
device generated in accordance with an embodiment  
of the present invention. The fourth network  
navigation device includes a PCMCIA memory card  
100 having stored therein machine-readable data  
representative of navigation instructions for  
10 linking to a resource. The PCMCIA memory card 100  
has a PCMCIA interface 102 for communicating the  
machine-readable data to a data reader with a  
mating PCMCIA interface.

15 The PCMCIA memory card 100 supports a first  
externally-viewable image 104 and a second  
externally-viewable image 106 at an exterior  
surface 108. Hence, the substrate as described  
earlier includes a portion of the housing of the  
PCMCIA memory card 100.

20 In this example, the first externally-viewable  
image 104 includes an image of a two-way pager  
available from Motorola. The second externally-  
viewable image 106 includes a logo of a service  
provider, such as an internet service provider,  
25 through which access to the electronic network 20  
is provided.

30 The machine-readable data includes  
instructions for connecting to the internet  
service provider. The instructions for connecting  
can include, for example, a telecommunication  
number (such as a phone number) which is to be



0       dialed to access the internet service provider.  
The machine-readable data can further include a  
code, such as a password, for authentication by  
the internet service provider. Based upon the  
code, access to the resource is either allowed,  
5       limited, or inhibited. Further, the code can be  
utilized by the internet service provider to  
uniquely identify the network navigation device.

In addition, the machine-readable data  
includes a representation of the URL for  
10       information on the two-way pager on the World Wide  
Web, which is [http://www.mot.com/  
MIMS/MSPG/Products/Two-way/tango/](http://www.mot.com/MIMS/MSPG/Products/Two-way/tango/). The internet  
service provider utilizes the URL to link the end  
user 28 to the resource to receive information on  
15       the two-way pager.

FIG. 8 illustrates a fifth network navigation  
device generated in accordance with an embodiment  
of the present invention. The network navigation  
device includes a substrate 110 which supports a  
20       magnetic storage medium 112. In the example of  
FIG. 8, the magnetic storage medium 112 has the  
form of a magnetic stripe, although alternative  
forms can be utilized. The magnetic storage  
medium 112 stores machine-readable data providing  
25       navigation instructions for linking to a resource.  
The machine-readable data is communicated to a  
data reader having a magnetic reading head, such  
as a magnetic stripe reader.

The substrate 110 supports a human-viewable  
30       image 114 indicative of a resource, such as a  
resource for a Motorola modem. Accordingly, the

0 magnetic storage medium 112 can store a  
representation of the URL for obtaining  
information on the Motorola modem, which is  
[http://www.mot.com/  
MIMS/ISG/Products/bit-surfr\\_pro/](http://www.mot.com/MIMS/ISG/Products/bit-surfr_pro/).

5 In the embodiment illustrated in FIG. 8, the  
substrate 110 has the size of a credit card (3.375  
inches by 2.25 inches). Preferably, the substrate  
110 is formed of a dielectric and/or nonmagnetic  
material such as paper, cardboard, or plastic.  
10 Here, magnetic material in the network navigation  
device is within the magnetic storage medium 112.

FIG. 9 illustrates a sixth network navigation  
device generated in accordance with an embodiment  
of the present invention. The sixth network  
15 navigation device includes a radio frequency tag  
120 containing navigation instructions for  
accessing a resource. The radio frequency tag 120  
includes a memory containing data representative  
of the navigation instructions, and a transmitter  
20 which transmits a signal representative of the  
data for external reception. The memory can be  
either read-only or read-write. In general, the  
radio frequency tag 120 can be either active (i.e.  
having an internal battery for powering its  
25 circuits) or passive (i.e. powering its circuits  
using externally-generated power).

Various commercially-available radio frequency  
tags can be utilized for the radio frequency tag  
120, including but not limited to, tags produced  
30 by Indala Corporation and the MicroStamp RIC  
(Remote Intelligent Communication) tags available

0 from Micron Communications, Inc. Illustrated in  
FIG. 9 is a network navigation device based on the  
MicroStamp RIC unit, which is postage-stamp sized  
(1.25 inches by 1.25 inches).

5 A human-viewable image 122 is supported by an  
exterior surface of the radio frequency tag 120.  
Hence, the substrate as described earlier includes  
a portion of the housing of the radio frequency  
tag 120. In this example, the human-viewable  
10 image 122 includes the Motorola logo, which  
indicates that the navigation instructions will  
link a user to a resource which provides  
information related to Motorola, Inc.

In this embodiment, the machine-readable data  
includes an electronic address for linking to a  
15 node (such as the node 24 in FIG. 1), and a code  
which identifies the resource to the node. The  
code is utilized so that the electronic address  
for the resource is concealed from end users. The  
node converts the code to an electronic address  
20 for the resource, links to the electronic address,  
and communicates content of the resource to the  
end user 28.

The machine-readable data further includes an  
instruction which initiates the execution of a  
25 predetermined Web browser for displaying the  
content of the resource. A logo for the  
predetermined Web browser is included in a second  
human-viewable image 124 supported by the exterior  
surface of the radio frequency tag 120.

30 FIG. 10 illustrates an example of a network  
access apparatus and examples of various data

0 readers for reading machine-readable data from a  
network navigation device. In this example, the  
network access apparatus includes a personal  
computer 130 having an input interface, such as a  
5 keyboard 132, and a display device, such as a  
monitor 134, coupled thereto.

The personal computer 130 communicates with an  
electronic network via a line 136, which can  
include a telephone line, an ISDN line, a coaxial  
line, a cable television line, a fiber optic line,  
10 a computer network line, or the like.  
Alternatively, the personal computer 130 can  
wirelessly communicate with the electronic  
network. Based on the mode of communication with  
the electronic network, the personal computer 130  
15 can include a modem and/or a transceiver to  
communicate with the electronic network. The  
electronic network can be provided by an online  
service, an Internet service provider, a local  
area network service, a wide area network service,  
20 a cable television service, a wireless data  
service, an intranet, or the like.

The various data readers coupled to the  
personal computer 130 include a bar code reader  
138, an RF tag reader 140, a PCMCIA card reader  
25 142, and a magnetic stripe reader 144. The bar  
code reader 138 is utilized to read bar-coded  
navigation instructions from a network navigation  
device, such as those illustrated in FIGS. 3 to 6.  
The RF tag reader 140 is utilized to receive and  
30 decode an electromagnetic signal representative of  
the navigation instructions generated by an RF

0 tag, such as one illustrated in FIG. 9. The  
PCMCIA card reader 142 interfaces with a PCMCIA  
card, such as one illustrated in FIG. 7, to read  
navigation instructions stored therein. The  
5 magnetic stripe reader 144 reads magnetically-  
stored navigation instructions stored by a  
magnetic stripe, such as one illustrated in FIG.  
8.

It is noted that the bar code reader 138 is  
illustrative of any optical reading device which  
10 can be utilized. Similarly, the PCMCIA card  
reader 142 is illustrative of any memory card  
reader which can be utilized, and the magnetic  
stripe reader 144 is illustrative of any magnetic  
reading device which can be utilized.

15 FIG. 11 is a flow chart of an embodiment of a  
method of linking to a resource in an electronic  
network. The method can be utilized by the  
network access apparatus 22 in FIG. 1 to  
automatically link the end user 28 to a resource  
20 encoded on the network navigation device 10.  
Typically, the end user 28 selects a desired  
resource to visit based upon the first human-  
viewable image 14 associated therewith on the  
network navigation device 10.

25 As indicated by block 150, the method includes  
a step of reading machine-readable data from a  
network navigation device. The machine-readable  
data is read using the data reader 30. The  
specific type of data reader utilized is selected  
30 based upon how the machine-readable data is stored  
on the network navigation device.

0           As indicated by block 152, a step of decoding  
the machine-readable data is performed to generate  
navigation instructions. The navigation  
instructions tell the network access apparatus 22  
how to link to the resource. As described  
5           earlier, the navigation instructions can include  
at least a portion of a URL or at least a portion  
of an IP address for the resource. If a partial  
address is received, an additional step of  
10           completing the electronic address can be  
performed. For example, if an IP address is  
received, the IP address can be prepended by  
"http://".

          Optionally, a step of storing the navigation  
instructions is performed as indicated by block  
15           154. The navigation instructions can be stored as  
a bookmark or stored in a favorites list, such as  
those available in many Web browsers, to provide a  
shortcut to the electronic address. Thereafter, a  
user can link to the resource by selecting the  
20           shortcut rather than having to re-read the  
navigation instructions from the network  
navigation device.

          Preferably, a representation of the first  
human-viewable image 14 is stored to provide an  
25           iconic representation for the shortcut to the  
resource. As a result, the association between  
the first human-viewable image 14 and the resource  
is reinforced. Similarly, a representation of the  
second human-viewable image 18 can be stored for  
30           display with the iconic representation. This  
further reinforces the association between the

0       second human-viewable image 18 and a service which provides the resource.

          To facilitate storing a representation of the human-viewable images 14 and 18, the machine-readable data can include machine-readable data  
5       representative of the human-viewable images 14 and 18 read in step 150. Alternatively, the human-viewable images 14 and 18 can be optically scanned into the network access apparatus 22 using a page scanner or the like. As another alternative, an  
10       electronic representation of the first human-viewable image 14 can be downloaded from the resource, and an electronic representation of the second human-viewable image 18 can be downloaded from the service upon linking thereto.

15       As indicated by block 156, a step of executing a predetermined network access routine is performed. The step of executing the predetermined network access routine can include any of: (i) executing a routine to connect and/or  
20       to logon to a service provider (e.g. executing a dial-up routine or a wireless authentication routine to connect to a service provider); and (ii) executing a client routine for subsequent user interaction with the electronic address (e.g.  
25       executing a graphical user interface routine or a Web browsing routine).

          The step of executing the predetermined network access routine can be executed prior to reading the machine-readable data in block 150.  
30       Alternatively, the predetermined network access routine can be automatically initiated upon

0       reading the machine-readable data in block 110.  
Here, the machine-readable data 16 can include  
instructions for directing the initiation of the  
predetermined network access routine, and for  
directing which predetermined network access  
5       routine is to be executed.

In particular, the machine-readable data 16  
can include instructions for directing the type  
and the specifics of the connection to be made to  
the electronic network 20. These instructions can  
10       dictate whether a wireline connection or a  
wireless connection should be made, and/or which  
wireline connection or which wireless connection  
should be made. As a result, the instructions on  
one network navigation device may direct a  
15       connection to a first service provider (e.g.  
America Online) while the instructions on another  
network navigation device direct a connection to a  
second service provider (e.g. CompuServe).

Further, the machine-readable data 16 can  
20       include instructions for selecting which client  
routine is to be executed. As a result, the  
instructions on one network navigation device may  
direct that a first graphical user interface  
routine (e.g. Netscape Navigator) be executed,  
25       while the instructions on another network  
navigation device direct a that second graphical  
user interface routine (e.g. Microsoft Internet  
Explorer) be executed.

As indicated by block 158, the method includes  
30       a step of linking to the resource using the  
navigation instructions. This step typically



0 includes transmitting the navigation instructions  
to the electronic network 20 to establish the link  
to the resource.

As indicated by block 160, the method includes  
a step of receiving content from the resource once  
5 the link is established. The content from the  
resource can include audible information and/or  
visual information, such as graphical information  
and/or textual information. Examples of the  
content include, but are not limited to, any  
10 combination of a file from a local hard drive, a  
file from a FTP server, an HTML document, content  
from a Gopher server, a message from a newsgroup,  
a transmission from a Telnet session, a  
transmission from a WAIS server, an animation  
15 file, a movie file, an audio file, downloadable  
software, and an electronic book file.

The content can also have the form of a  
videotelephone call with an individual. Here, for  
example, the first human-viewable image 14 can  
20 include a picture and/or a name of the individual,  
and the machine-readable data can include a  
telecommunication number or an electronic address  
for communicating with the individual.

As indicated by block 162, the method includes  
25 a step of displaying the content from the  
resource. The content can be displayed on the  
display device 32 or the hard copy device 38. As  
described earlier, the content can include an  
image which corresponds to at least a portion of  
30 the first human-viewable image 14 on the network  
navigation device 10. Additionally, the content

0        can include an image which corresponds to at least  
a portion of the second human-viewable image 18.

      As indicated by block 164, the method  
optionally includes a step of receiving a user-  
initiated event associated with a print request.  
5        The user-initiated event can include, for example,  
a step of receiving a print command issued by the  
end user 28 within the client routine.

      As indicated by block 166, the method  
optionally includes a step of producing another  
10       network navigation device in response to receiving  
the user-initiated event. In general, this  
network navigation device is produced in  
accordance with any of the embodiments of the  
method described with reference to FIG. 2. Of  
15       particular interest, however, is the case in which  
machine-readable data for linking to the resource  
and any human-viewable images are printed onto a  
substrate using a hard copy device. Here, in an  
exemplary embodiment, the content of the resource  
20       is printed to one or more pages of printing  
material, such as paper, cardboard, or plastic.  
The machine-readable data is printed to at least  
one of the one or more pages, and preferably, to  
each of the one or more pages.

25       An article of manufacture can be formed to  
direct a network access apparatus to perform the  
above-described steps. The article of manufacture  
can include a computer-readable storage medium  
having computer-readable data stored therein which  
30       directs the network access apparatus to perform  
the above-described steps. Examples of the

0 computer-readable storage medium include, but are  
not limited to, a logic circuit, a memory, a mass  
storage medium, an optical disk, a CD-ROM, a  
magnetic disk, a floppy disk, a hard disk, and a  
PCMCIA card.

5 FIG. 12 illustrates an example display of  
content of a resource using the network navigation  
device of FIG. 3. The display includes content  
170 from the resource, which includes an image 172  
corresponding to the first human-viewable image  
10 42. The display further includes content 174  
added by the linking service. The content 174  
includes an image 176 corresponding to the second  
human-viewable image 44.

15 FIG. 13 illustrates an example of a step of  
receiving a user-initiated event associated with a  
print request. This example continues with the  
example display of FIG. 12. The user-initiated  
event includes pointing a cursor 180 to a print  
hot spot 182 on the display, and clicking on the  
20 print hot spot 182. It is noted that the print  
hot spot 182 can be located at an icon indicative  
of the print command rather than within a pull-  
down menu 184 as illustrated. Alternatively, the  
print command can be issued by a user-initiated  
25 event received via a keyboard. Here, for example,  
the print command can be issued by the end user  
depressing "ALT-p" using the keyboard.

FIG. 14 illustrates an example of a hard copy  
output produced in response to receiving the print  
30 command. The hard copy output is produced on a

0        sheet 188 of material, such as paper, cardboard,  
or plastic, using the hard copy device 38.

5        The hard copy output includes the content 170  
from the resource and optionally the content 174  
added by the linking service. The hard copy  
output further includes machine-readable data 190  
for linking to the resource. The machine-readable  
data 190 allows the end user or another user to  
quickly re-link to the resource using the hard  
copy output.

10       The machine-readable data 190 has the form of  
printed data, such as a one-dimensional or a two-  
dimensional bar code. Although the machine-  
readable data 190 can be located anywhere on the  
sheet 188, it is preferred that the machine-  
15       readable data 190 be printed near any peripheral  
edge 192 of the sheet 188. More preferably, the  
machine-readable data 190 is printed in either a  
header 194 or a footer 196 of the sheet 188. In  
the embodiment illustrated in FIG. 13, the  
20       machine-readable data 190 is printed on a left  
side of the footer 196.

25       Additional information can also be printed in  
the header 194 and the footer 196 of the sheet  
188. The additional information can include a  
human-viewable form 198 of the electronic address,  
a page number 200 for the sheet 188, a date 202  
and a time (not illustrated) at which the resource  
was visited or the hard copy output was printed.

30       It is noted that, in this example, the  
resource can be initially visited by the end user

0        28 with or without the use of a network navigation device in accordance with the present invention.

FIG. 15 is a flow chart of an embodiment of a method of producing a network navigation device based on a browsing history of the end user 28.

5        As indicated by block 210, the method includes a step of browsing at least one resource in the electronic network 20. The at least one resource can be browsed by the end user 28 with or without the use of a network navigation device in

10       accordance with the present invention. Typically, the at least one resource includes a plurality of resources.

As indicated by block 212, the method includes a step of recording a browsing history of the at

15       least one resource in the electronic network 20. The step of recording the browsing history can include any of: recording an electronic address for each of the at least one resource, recording a respective image included in the content of each

20       resource, recording a sequence in which the at least one resource was browsed, and recording a hierarchy of the at least one resource in the electronic network 20. The browsing history can be recorded in a storage device associated with

25       either the network access apparatus 22 or the electronic network 20.

As indicated by block 214, the method includes a step of producing a network navigation device for the at least one resource. The step of

30       producing the network navigation device can be

0 performed using any embodiment of the method  
described with reference to FIG. 2.

5 The network navigation device is produced  
using the respective image and a machine-readable  
form of the electronic address for each of the at  
least one resource in the browsing history. The  
images and the machine-readable data produced  
thereby can be formatted in accordance with the  
sequence in which the at least one resource was  
browsed, or in accordance with the hierarchy of  
10 the at least one resource in the electronic  
network.

FIG. 16 is an illustration of a first  
embodiment of a network navigation device for a  
plurality of resources. The network navigation  
15 device is produced on a sheet 220 of material,  
such as paper, plastic, or cardboard, using a hard  
copy device.

For each of the plurality of resources, the  
network navigation device includes a human-  
20 viewable image 222 and machine-readable data 224.  
Each human-viewable image 222 indicates its  
respective resource to the end user 28, while each  
machine-readable data 224 provides an instruction  
to link to the resource. Each machine-readable  
25 data 224 has the form of printed data, such as a  
one-dimensional or a two-dimensional bar code.  
The human-viewable image 222 and the machine-  
readable data 224 for the plurality of resources  
may be arranged sequentially in accordance with a  
30 sequence in which the plurality of resources was  
visited.

0            Optionally, the network navigation device  
includes: (i) a human-viewable image 226  
associated with a service provider; (ii) a human-  
viewable image 228 associated with a client  
routine; (iii) a human-viewable image 230  
5 associated with a node in the electronic network;  
and (iv) a human-viewable image 232 associated  
with an advertiser. As illustrated, each of the  
human-viewable images 226, 228, 230, and 232 can  
include a respective logo or the like. The  
10 service provider, the client routine, and the node  
can be those utilized to browse the plurality of  
resources, or can be others which may be utilized  
in a subsequent browsing session.

Proximate to the human-viewable image 226 is  
15 machine-readable data 234 associated with the  
service provider. The machine-readable data 234  
can provide instructions to connect and/or to  
login to the service provider. Alternatively, the  
machine-readable data 234 can provide an  
20 instruction for linking to a resource which  
provides information regarding the service  
provider.

Proximate to the human-viewable image 228 is  
machine-readable data 236 associated with the  
25 client routine. The machine-readable data 236 can  
provide instructions for executing the client  
routine, for downloading the client routine from  
the electronic network 20, or for obtaining  
information about the client routine from the  
30 electronic network 20.

0 Proximate to the human-viewable image 230 is machine-readable data 238 associated with the node in the electronic network. The machine-readable data 238 can provide instructions for linking to the node, for example.

5 Proximate to the human-viewable image 232 is machine-readable data 240 associated with the advertiser. The machine-readable data can provide instructions for linking to a resource associated with the advertiser.

10 Preferably, each item of the machine-readable data 234, 236, 238, and 240 has the form of printed data, such as a one-dimensional or a two-dimensional bar code.

15 Additional information can also be printed on the sheet 220, such as a date 242 and a time 244 at which the plurality of resources was visited or the network navigation device was produced.

20 FIG. 17 is an illustration of a second embodiment of a network navigation device for a plurality of resources. The network navigation device is produced on a sheet 250 of material, such as paper, plastic, or cardboard, using a hard copy device.

25 For each of the plurality of resources, the network navigation device includes a human-viewable image 252 and machine-readable data 254, such as the human-viewable image 222 and the machine-readable data 224 described with reference to FIG. 16. The human-viewable image 252 and the machine-readable data 254 for the plurality of  
30 resources are arranged hierarchically in



0 accordance with the hierarchy of the plurality of  
resources in the electronic network 20. For  
example, a resource represented by reference  
numeral 256 can be a home page having hyperlinks  
5 to resources represented by reference numerals  
258, 260, and 262. The resource represented by  
reference numeral 258 has hyperlinks to resources  
represented by reference numerals 264 and 266.  
The resource represented by reference numeral 262  
10 has a hyperlink to a resource indicated by  
reference numeral 268.

The network navigation device optionally  
includes human-viewable images 270, 272, 274, and  
276, such as the human-viewable images 226, 228,  
230, and 232 described with reference to FIG. 16.  
15 Further, the network navigation device can  
optionally include machine-readable data 278, 280,  
282, and 284, such as the machine-readable data  
234, 236, 238, and 240 described with reference to  
FIG. 16. Still further, the network navigation  
20 device can include additional information such as  
a date 286 and a time 288 at which the plurality  
of resources was visited or the network navigation  
device was produced.

FIG. 18 is an illustration of a third  
25 embodiment of a network navigation device for a  
plurality of resources. The network navigation  
device is produced on a sheet 290 of material,  
such as paper, plastic, or cardboard, using a hard  
copy device.

30 For each of the plurality of resources, the  
network navigation device includes a human-

0       viewable image 292 and machine-readable data 294,  
      such as the human-viewable image 222 and the  
      machine-readable data 224 described with reference  
      to FIG. 16. The human-viewable image 292 and the  
5       machine-readable data 294 for the plurality of  
      resources are printed to appear in perspective  
      views. For example, each human-viewable image 292  
      and machine-readable data 294 can appear within a  
      perspective view of a respective card 296. To  
10       provide a sense of depth, a respective shadow 298  
      can be printed for each respective card 296.

      FIG. 19 is a flow chart of an embodiment of a  
      method of producing a network navigation device.  
      The method can be initiated either at the premises  
      of the end user 28 or at a node in the electronic  
15       network 20.

      As indicated by block 300, the method includes  
      a step of initiating a search of the electronic  
      network 20. The step of initiating the search is  
      performed to locate resources in the electronic  
20       network 20. The search can be initiated by a  
      human, such as the end user 28, or can be  
      autonomously initiated by either the network  
      access apparatus 22 or a node in the electronic  
      network 20 (such as the node 24). The resources  
25       to be located can be known or unknown to the  
      initiator of the search at the time of initiating  
      the search. The search can be performed using any  
      of the following: (i) a search engine; (ii) a  
      software agent; (iii) a software robot; (iv) a  
30       network worm; (v) a network spider; or (vi) a  
      network crawler.

0           As indicated by block 302, the method includes  
a step of locating at least one resource in the  
electronic network 28 as a result of the search.  
Each of the at least one resource can be  
identified by an electronic address therefor.  
5           Typically, the step of locating at least one  
resource results in locating a plurality of  
resources in the electronic network 28.

          As indicated by block 304, the method includes  
a step of retrieving content from each of the at  
10          least one resource. Preferably, the content from  
each of the at least one resource includes a  
human-viewable image indicative of the resource.

          As indicated by block 306, the method includes  
a step of producing at least one network  
15          navigation device for the at least one resource.  
The at least one network navigation device is  
produced in accordance with any embodiment of the  
method described with reference to FIG. 2. Each  
network navigation device is produced using a  
20          machine-readable form of the electronic address  
for a respective resource, and the human-viewable  
image included in the content of the respective  
resource. In general, each network navigation  
device can be associated with a single resource  
25          (as in the examples of FIGS. 3 to 9 and FIG. 14)  
or with a plurality of resources (as in the  
examples of FIGS. 16 to 18).

          To track changes in the content of the at  
least one resource, flow of the method is directed  
30          back to block 304. The at least one resource is  
retrieved to determine if any changes have

0 occurred in the content or in the electronic  
address. If so, then subsequent network  
navigation devices produced in block 306 utilize a  
modified human-viewable image and/or modified  
machine-readable data for the resource.

5 FIG. 20 is a block diagram of an embodiment of  
a system for producing a network navigation  
device. The system includes a processing  
apparatus 310, a computer-readable storage medium  
312, and at least one output device 314. The  
10 computer-readable storage medium 312 stores  
computer-readable data to direct the processing  
apparatus 310 to produce the network navigation  
device. The computer-readable data is utilized by  
the processing apparatus 310 to direct the at  
15 least one output device 314 to write machine-  
readable data to a substrate and to write a first  
human-viewable image to the substrate. The  
machine-readable data provides an instruction for  
linking to a resource in an electronic network,  
20 and the first human-viewable image provides an  
association with the resource. The above-  
described system can be further utilized to  
perform any additional steps described herein for  
producing the network navigation device.

25 Examples of the processing apparatus 310  
include, but are not limited to: (i) embodiments  
of the network access apparatus 22 described  
herein; (ii) a general purpose computer; and (iii)  
a server on a node in the electronic network. The  
30 processing apparatus 310 can be located proximate

0 to the end user 28 or the node in the electronic network 20.

Examples of the computer-readable storage medium 312 include, but are not limited to, a logic circuit, a memory, a mass storage medium, an optical disk, a CD-ROM, a magnetic disk, a floppy disk, a hard disk, and a PCMCIA card. The computer-readable storage medium 312 can be located at the premises of the end user 28, at the premises of the node in the electronic network 20, or elsewhere. If located at the node, the computer-readable data stored by the computer-readable storage medium 312 can be downloaded to end users via the electronic network 20.

Further, the computer-readable storage medium 312 can include computer-readable data which provides additional software, such as a client program, a browser program, a word processing program, or a desktop publishing program, for initiating or assisting in the production of the network navigation device.

Examples of the at least one output device 314 include any combination of one or more of: (i) a hard copy output device, such as any of the examples of the hard copy device 38 described herein; (ii) magnetic data writer, such as a magnetic stripe writer; (iii) an RF tag writer; and (iv) a memory writer, such as a PCMCIA card writer. The at least one output device 314 can be located at the premises of the end user 28, at the premises of the node in the electronic network 20, or elsewhere.

0           In general, the above-described system can be  
utilized to produce a network navigation device,  
or by a service at the node to produce network  
navigation devices. If located at different  
premises, the processing apparatus 310, the  
5           computer-readable storage medium 312, and the at  
least one output device 314 can communicate via  
the electronic network 20 to produce the network  
navigation device.

10           FIG. 21 illustrates an embodiment of a  
substrate for use in forming a network navigation  
device. The substrate includes a sheet of  
material 320. The sheet of material 320 can be  
formed of paper, plastic, cardboard, or other  
printing material. The sheet of material 320 can  
15           be sized in accordance with a standard size of  
printing material, or can have a custom size.

20           The substrate includes a first plurality of  
concertina folds 322 and a second plurality of  
concertina folds 324. The first plurality of  
concertina folds 322 is oriented transverse to,  
and preferably perpendicular to, the second  
plurality of concertina folds 324. It is also  
preferred that the first plurality of concertina  
folds 322 consists of an even number of folds, and  
25           that the second plurality of concertina folds 324  
consists of an even number of folds. In an  
exemplary embodiment, the first plurality of  
concertina folds 322 consists of two folds and the  
second plurality of concertina folds 324 consists  
30           of two folds.

0           The first and second plurality of concertina  
folds 322 and 324 divide the sheet of material 320  
into a plurality of segments. The plurality of  
segments includes a first corner segment 326 and a  
5           second corner segment 328. The first corner  
segment 326 is diagonally opposite to the second  
corner segment 328.

          A first tab 330 is disposed at the first  
corner segment 326 and a second tab 332 is  
disposed at the second corner segment 328. The  
10          first tab 330 and the second tab 332 may be  
grasped by a user to fold or to unfold the  
substrate.

          Typically, the first tab 330 and the second  
tab 332 are smaller than the first corner segment  
15          326 and the second corner segment 328. The first  
tab 330 and the second tab 332 can be formed of  
the same material as the sheet of material 320, or  
can be formed using a different material.  
Further, the first tab 330 and the second tab 332  
20          can have the same thickness and/or the same  
stiffness as the sheet of material 320. The first  
tab 330 and the second tab 332 can be integrated  
into the form of the sheet of material 320, or can  
be attached to the sheet of material 320 after the  
25          sheet of material 320 has been formed.

          FIG. 22 is an illustration of the substrate of  
FIG. 21 in a first partially-folded state. The  
first partially-folded state is attained as the  
user begins to move at least one of the first tab  
30          330 and the second tab 332 substantially parallel  
to a first axis 334. The first axis 334 is

0 transverse to, and preferably perpendicular to,  
the orientation of the first plurality of  
concertina folds 322. As illustrated, the  
substrate folds along the first plurality of  
concertina folds 322 in the first partially-folded  
5 state.

FIG. 23 is an illustration of the substrate of  
FIG. 21 in a second partially-folded state. The  
second partially-folded state is attained as the  
user continues to move at least one of the first  
10 tab 330 and the second tab 332 along a path  
substantially parallel to the first axis 334. As  
illustrated, the substrate is completely folded  
along the first plurality of concertina folds 322  
in the second partially-folded state.

15 FIG. 24 is an illustration of the substrate of  
FIG. 21 in a third partially-folded state. The  
third partially-folded state is attained as the  
user begins to move at least one of the first tab  
330 and the second tab 332 substantially parallel  
20 to a second axis 336. The second axis 336 is  
transverse to, and preferably perpendicular to,  
the second plurality of concertina folds 324. As  
illustrated, the substrate folds along the second  
plurality of concertina folds 324 in the third  
25 partially-folded state.

FIG. 25 is an illustration of the substrate of  
FIG. 21 in a completely-folded state. The  
completely-folded state is attained as the user  
continues to move at least one of the first tab  
30 330 and the second tab 332 along a path parallel  
to the second axis 336. As illustrated, the



0        substrate is completely folded along the second  
plurality of concertina folds 324, as well as  
along the first plurality of concertina folds 322,  
in the completely-folded state.

5        The user can unfold the substrate by reversing  
the process described with reference to FIGS. 21  
to 25. Specifically, the substrate is unfolded  
by, firstly, moving at least one of the first tab  
330 and the second tab 332 apart along the second  
axis 336, and secondly, moving at least one of the  
10       first tab 330 and the second tab 332 apart along  
the first axis 334.

Embodiments of the above-described substrate  
can support any combination of the human-viewable  
images and machine-readable data described herein  
15       to provide a network navigation device. Further,  
the substrate can support supplementary  
information, such as human-readable information  
describing how to use the network navigation  
device and/or human-readable information  
20       describing the resources which can be accessed  
using the network navigation device. Also, the  
substrate can provide space for printing a summary  
of a navigation session using the hard copy device  
38 in FIG. 1.

25       Thus, there has been described several  
embodiments, including preferred embodiments, of a  
method, system, and article of manufacture for  
producing a network navigation device.

Because the various embodiments of the present  
30       invention generate a device having a human-  
viewable image which is associated with a resource

0 at an electronic address and having machine-  
readable data for linking to the electronic  
address, they provide a significant improvement in  
that the addressing format and the address itself  
become more transparent to the end user.

5 Consequently, the problem of address complexity  
using embodiments of the network navigation device  
and the importance of reserving desired domain  
names is reduced.

10 Additionally, the various embodiments of the  
present invention as herein-described provide  
methods and systems for an end user to produce a  
network navigation device. The methods can be  
utilized by the end user within a document browser  
software program, a word processor program, or a  
15 desktop publishing program, for example, to  
produce the network navigation device.

Further, the various embodiments of the  
present invention provide methods and systems for  
an automated service to produce network navigation  
20 devices.

It will be apparent to those skilled in the  
art that the disclosed invention may be modified  
in numerous ways and may assume many embodiments  
other than the preferred forms specifically set  
25 out and described above.

Accordingly, it is intended by the appended  
claims to cover all modifications of the invention  
which fall within the true spirit and scope of the  
invention.

30 What is claimed is:

0

## Claims

1. A method of producing a network navigation device, the method comprising the steps of:

5

writing machine-readable data to a substrate, the machine-readable data providing at least one instruction for linking to a resource in an electronic network; and

10

writing a first human-viewable image to the substrate, the first human-viewable image associated with the resource.

15

2. The method of claim 1 further comprising at least one of the steps of recording a browsing history of at least one resource in the electronic network, wherein the at least one resource is associated with the machine-readable data and the first human-viewable image; initiating a search of the electronic network; locating at least one resource in the electronic network, wherein the at least one resource includes the resource for which the machine-readable data and the first human-viewable image are written; and receiving a user-initiated event, wherein the steps of writing the machine-readable data and writing the first human-viewable image are performed in response to receiving the user-initiated event.

20

25

30

3. The method of claim 1 wherein at least a portion of the first human-viewable image

0 corresponds to an image viewable upon linking to  
the resource.

4. The method of claim 1 wherein the step of  
writing the first human-viewable image includes  
5 printing the first human-viewable image onto the  
substrate or printing content of the resource onto  
the substrate.

5. The method of claim 1 wherein the  
10 machine-readable data includes at least one of an  
electronic address for the resource, at least a  
portion of a uniform resource locator for the  
resource, and at least a portion of an internet  
protocol address for the resource.

15 6. The method of claim 1 wherein the  
machine-readable data includes a bar code.

7. The method of claim 1 wherein the step of  
20 writing the machine-readable data includes writing  
the machine-readable data to a magnetic storage  
medium supported by the substrate or writing the  
machine-readable data to a memory supported by the  
substrate.

25 8. The method of claim 7 wherein the substrate  
includes a portion of a housing of a memory card  
or a radio frequency tag, and wherein the machine-  
readable data includes an instruction for  
30 directing an initiation of a network access  
routine.

0

9. A system for producing a network navigation device, the system comprising:

5

a processing apparatus which directs at least one output device to write machine-readable data to a substrate and to write a first human-viewable image to the substrate, wherein the machine-readable data provides at least one instruction for linking to a resource in an electronic network, and wherein the first human-viewable image is associated with the resource.

10

10. An article of manufacture for producing a network navigation device, the article of manufacture comprising:

15

a computer-readable storage medium; and computer readable data stored by the computer-readable storage medium, the computer-readable data utilized by a processing apparatus to direct at least one output device to write machine-readable data to a substrate and to write a first human-viewable image to the substrate, the machine-readable data providing at least one instruction for linking to a resource in an electronic network, the first human-viewable image being associated with the resource.

20

25

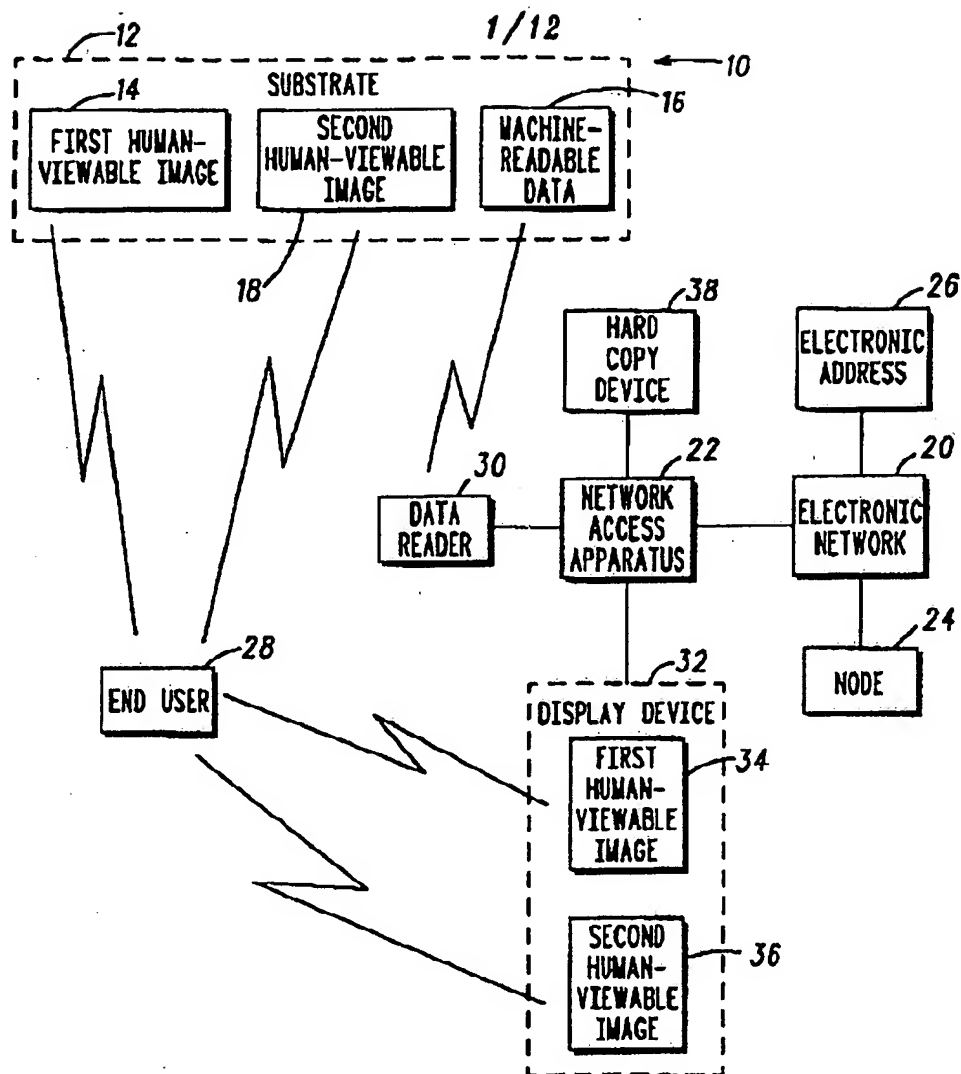


FIG. 1

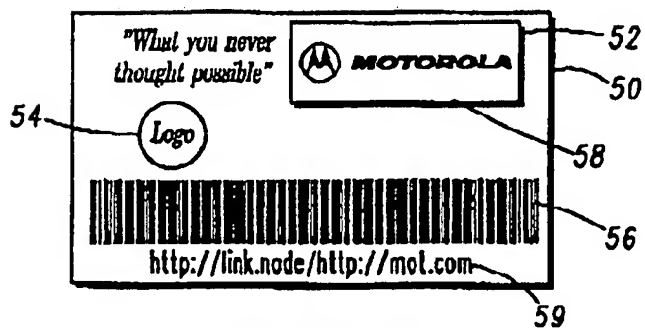


FIG. 3

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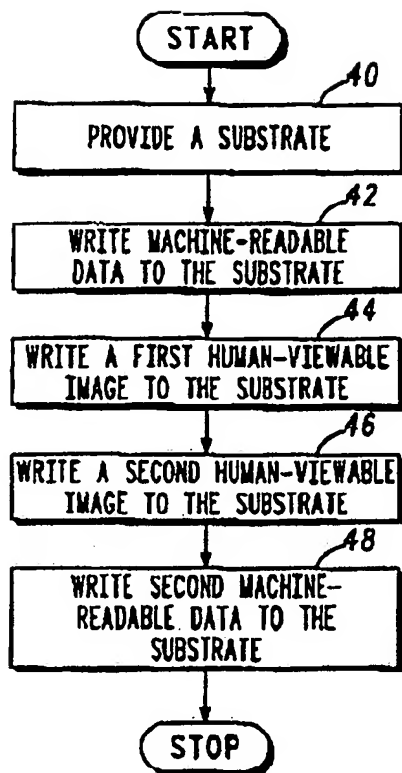


FIG.2

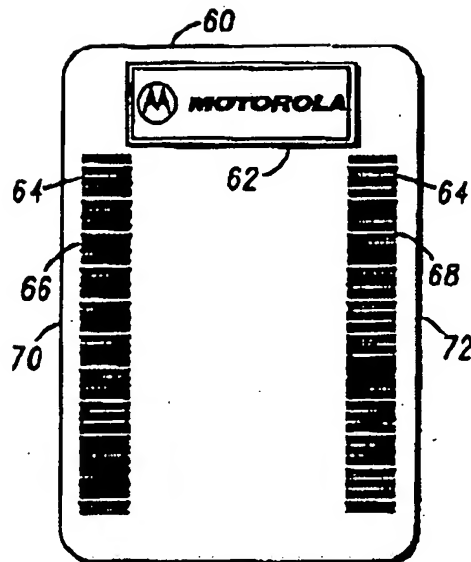


FIG.4

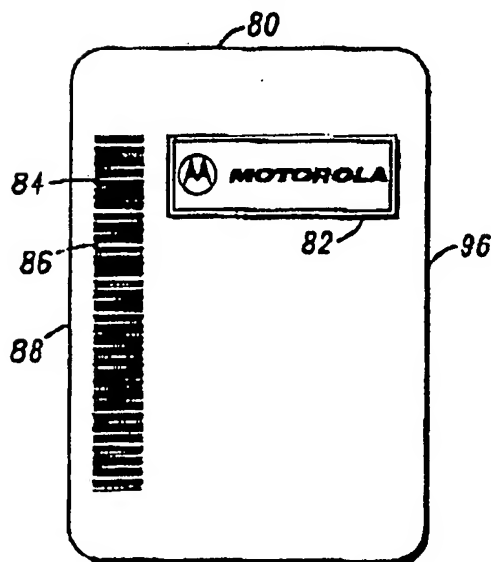


FIG.5

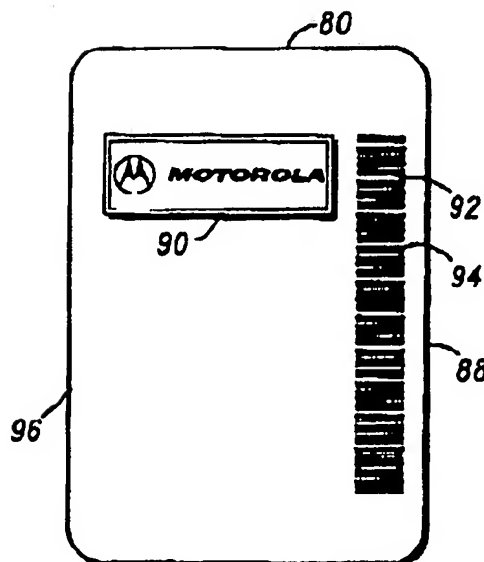
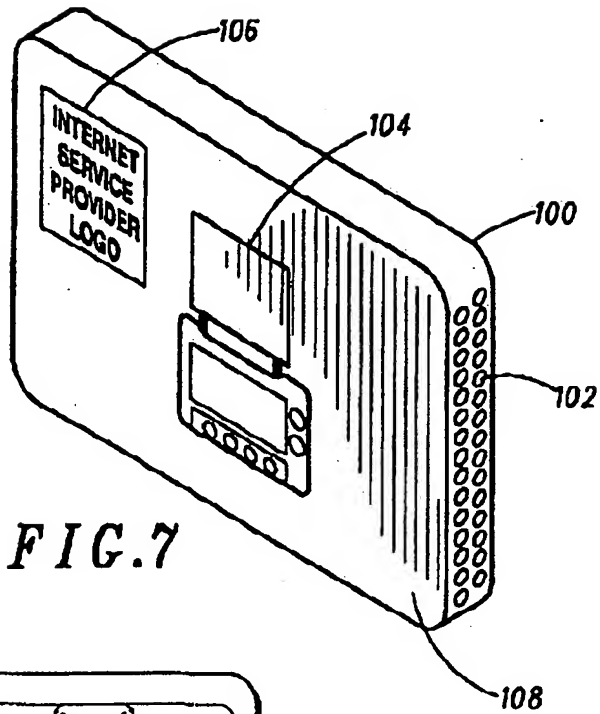
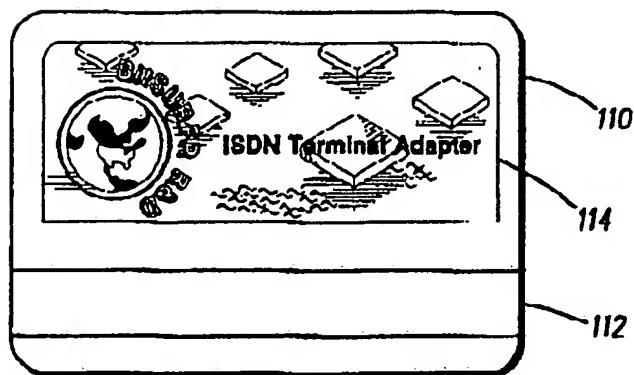
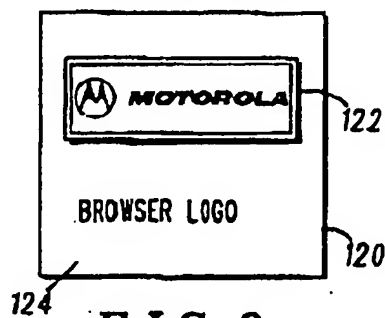
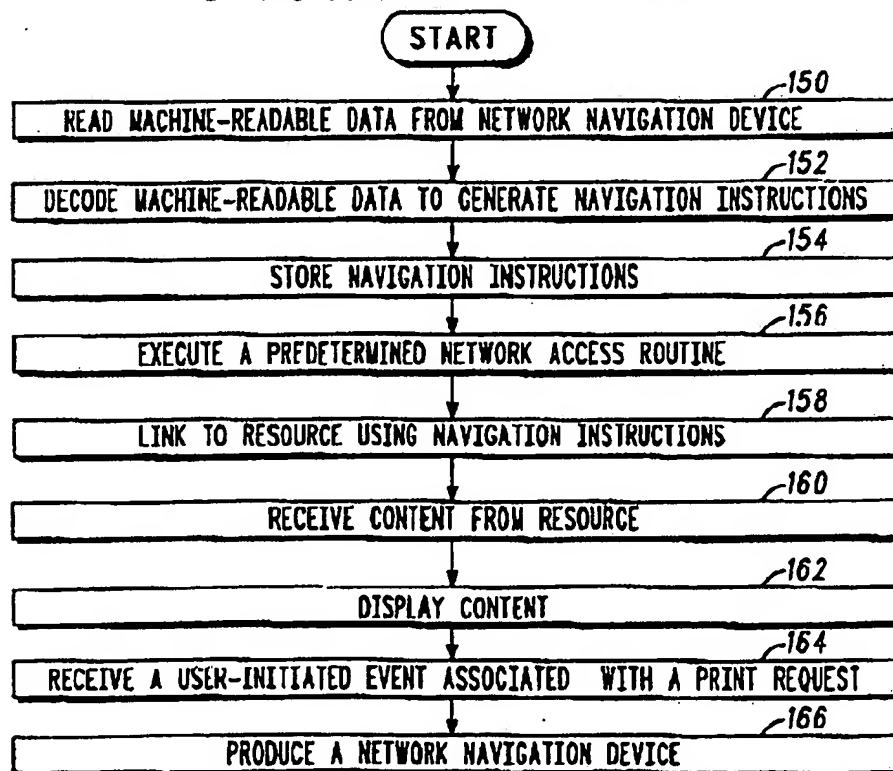
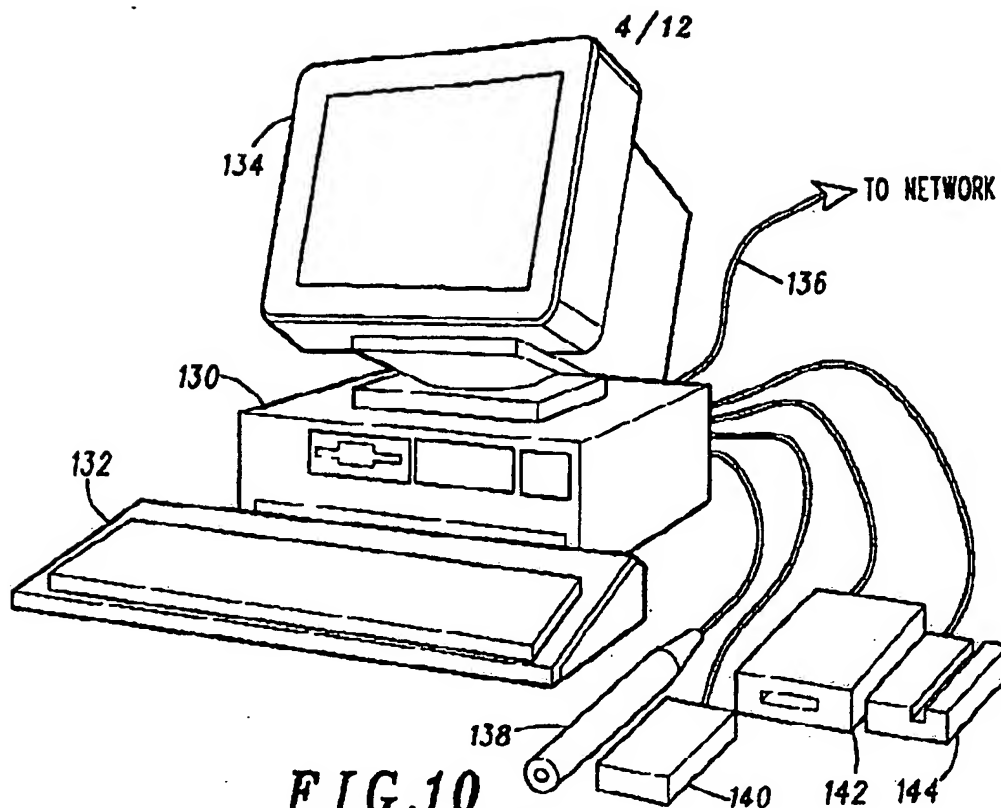


FIG.6

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*FIG. 7**FIG. 8**FIG. 9*





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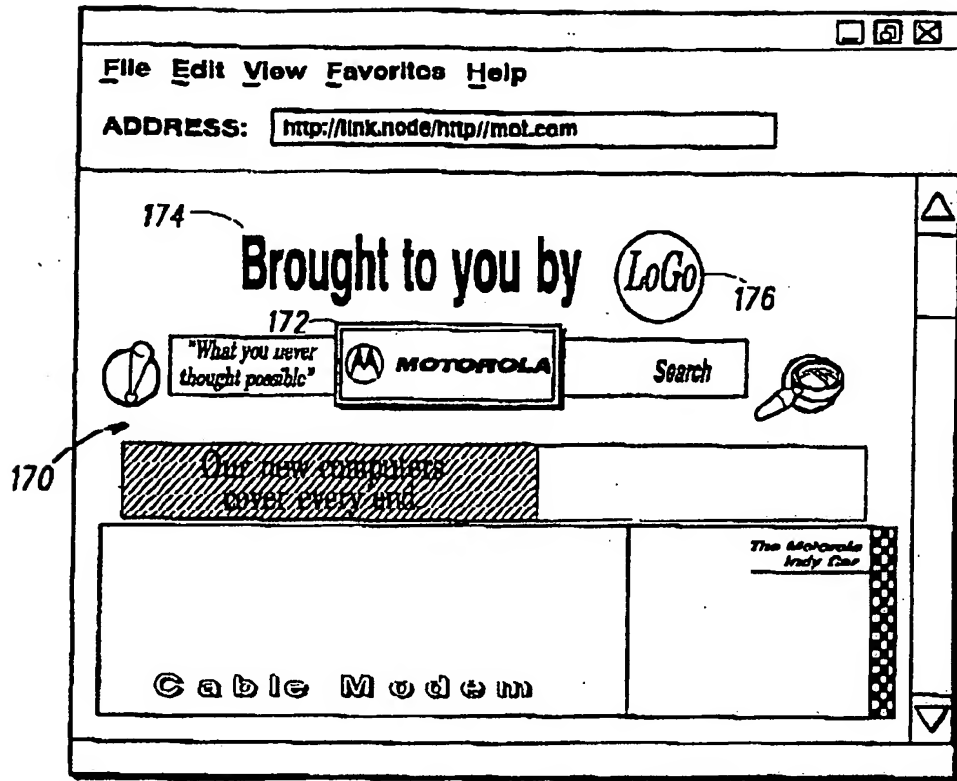


FIG. 12

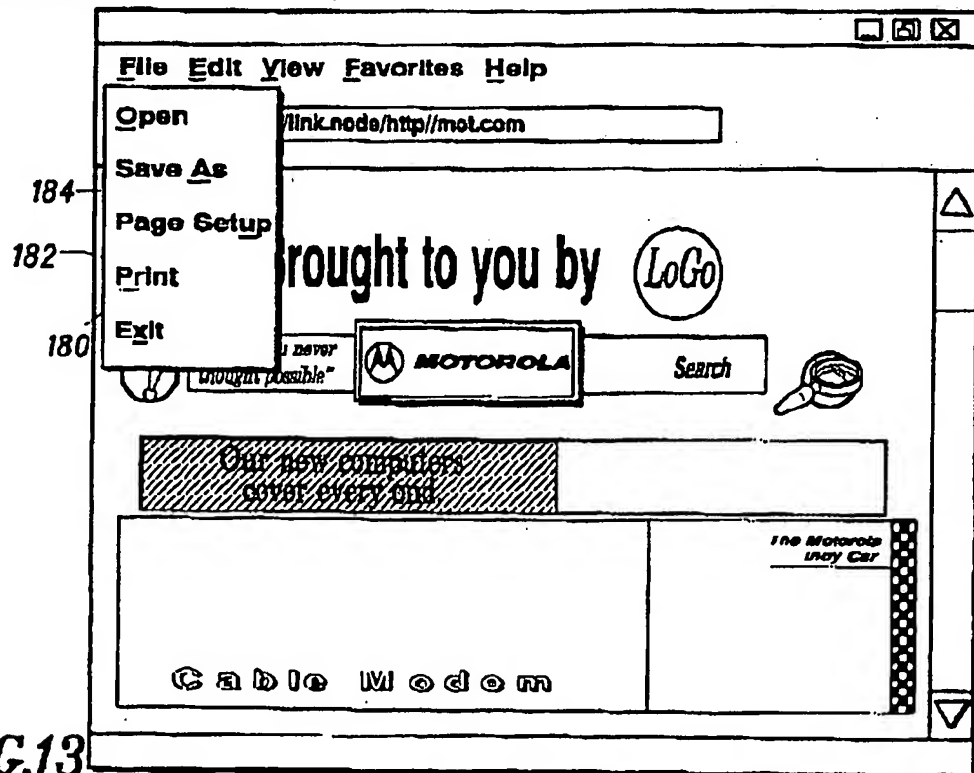


FIG. 13

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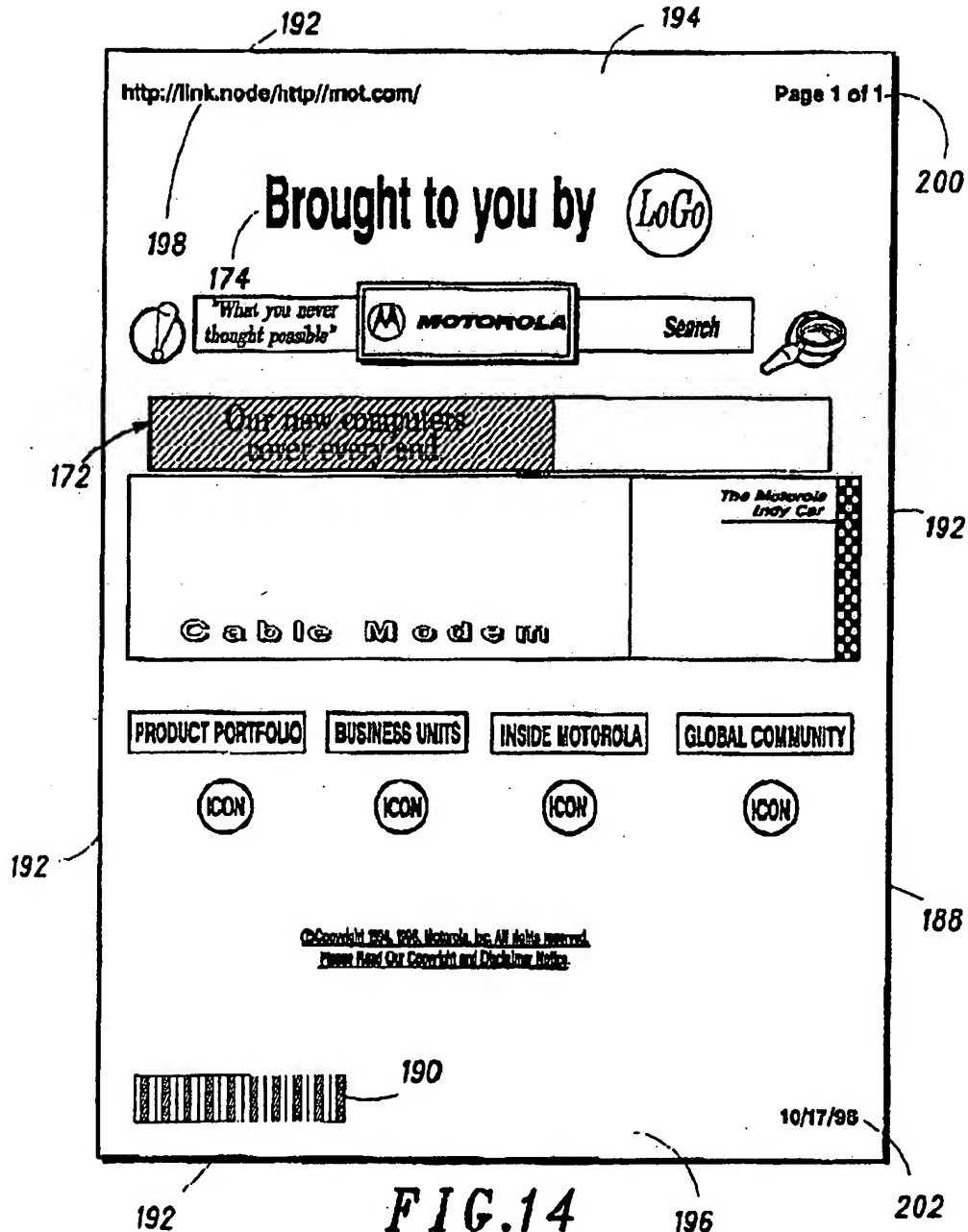


FIG.14

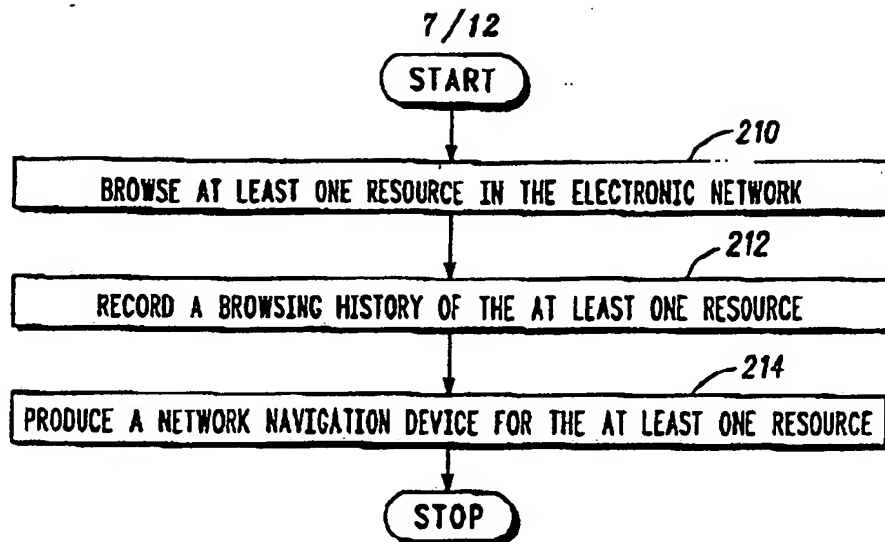


FIG. 15

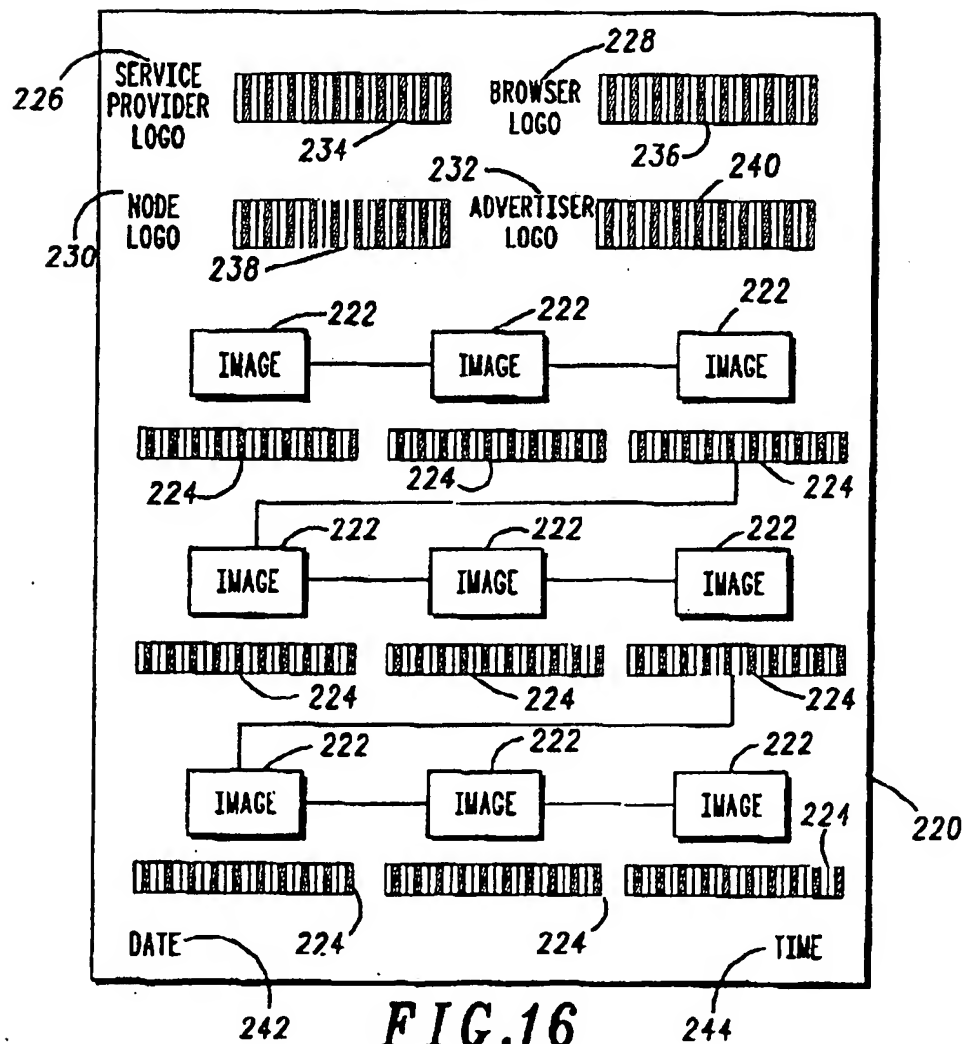


FIG. 16

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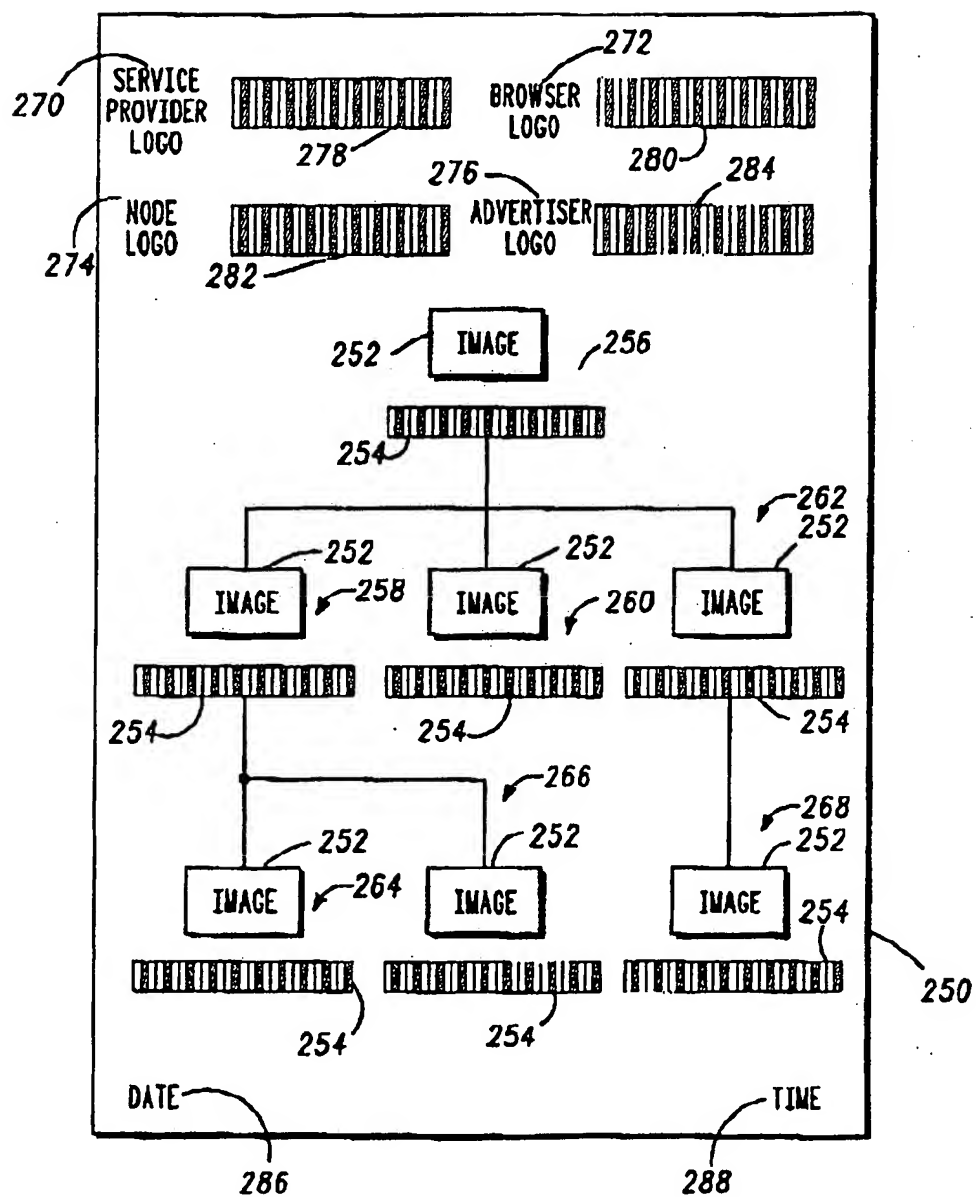
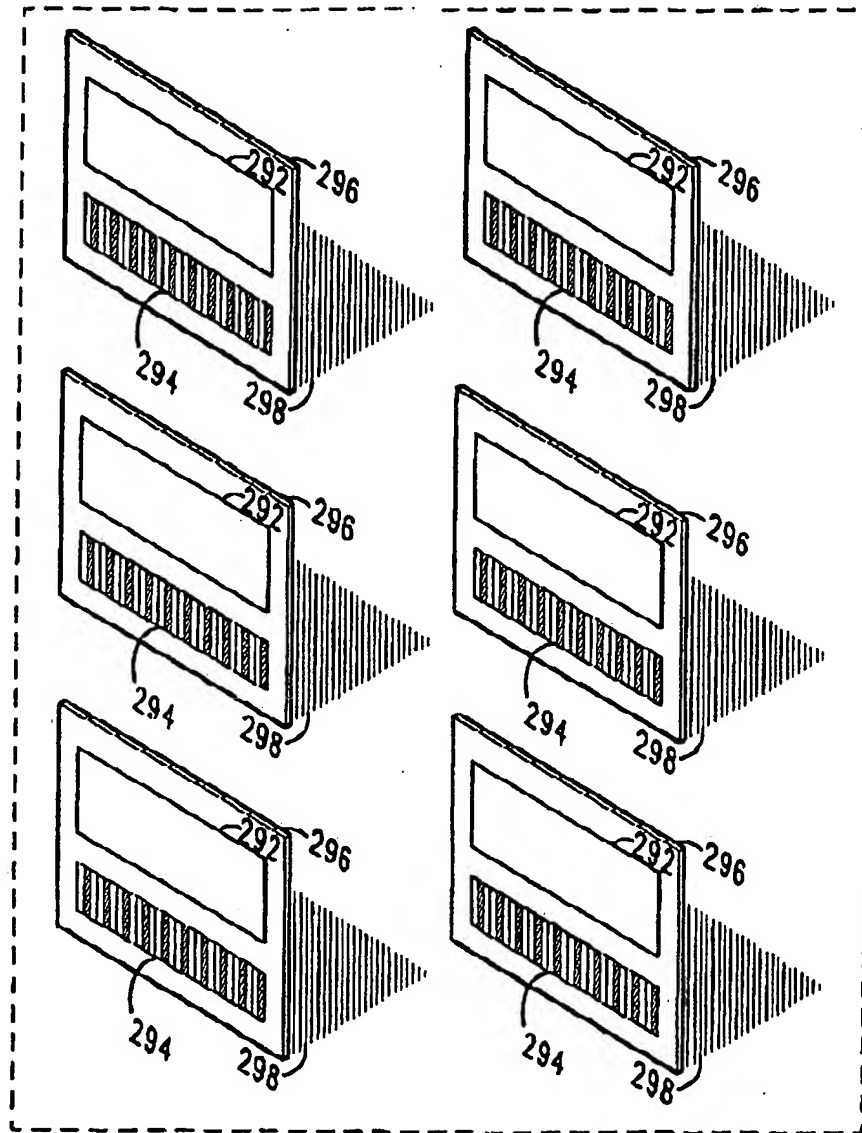


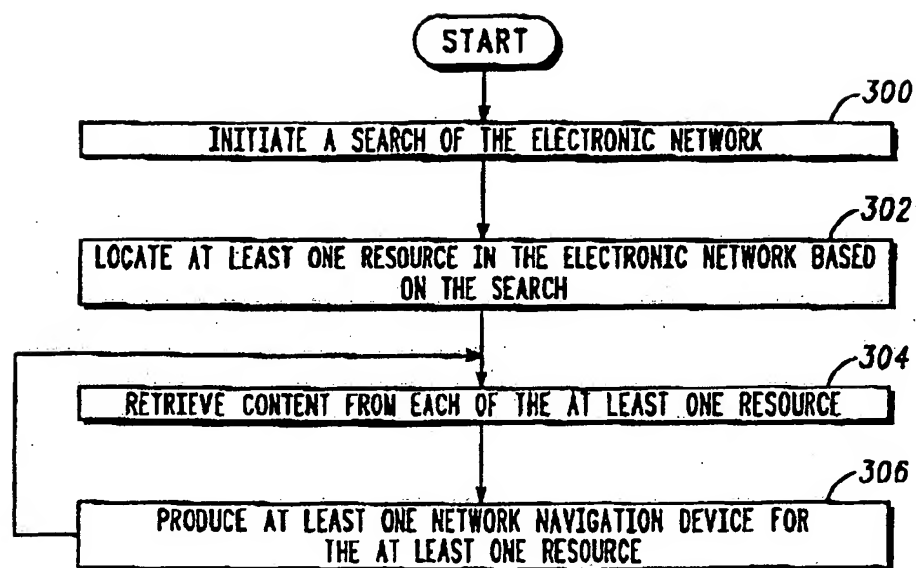
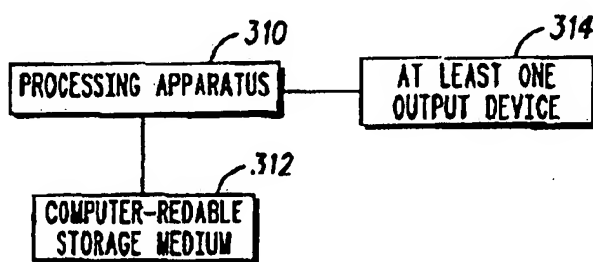
FIG. 17

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**FIG.18**

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*FIG. 19**FIG. 20*

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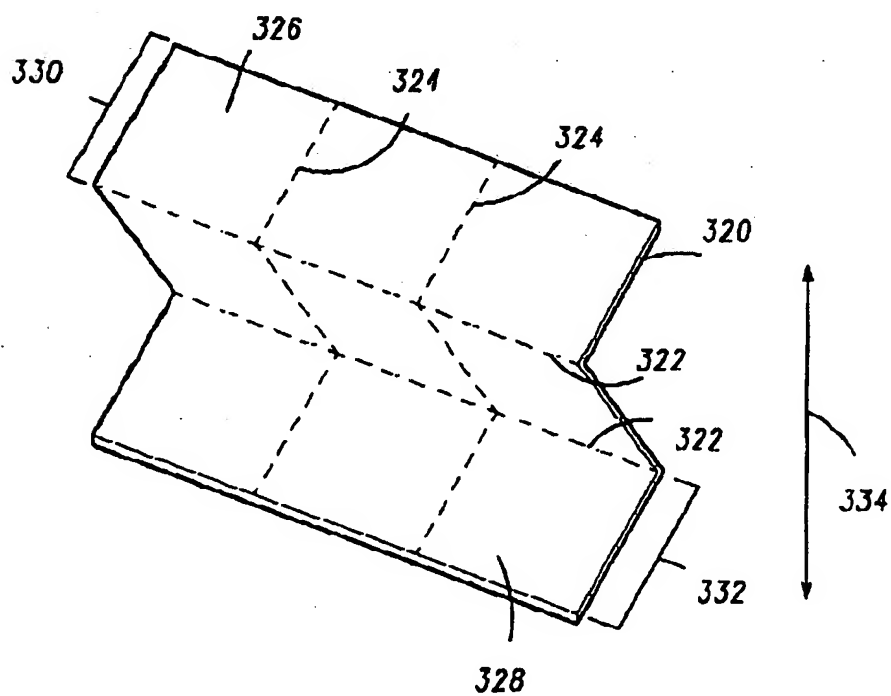
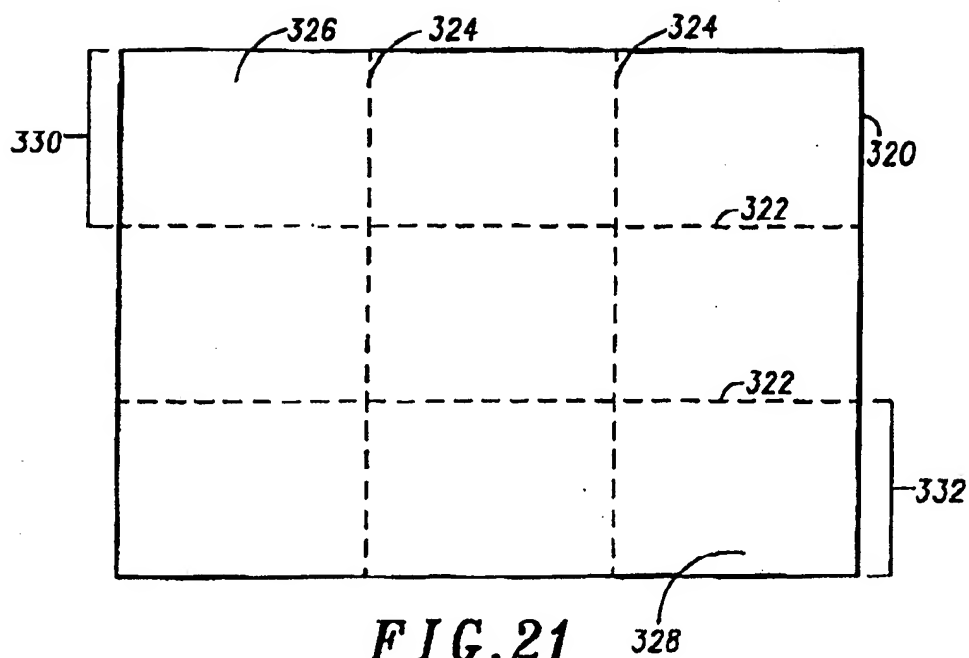


FIG. 22



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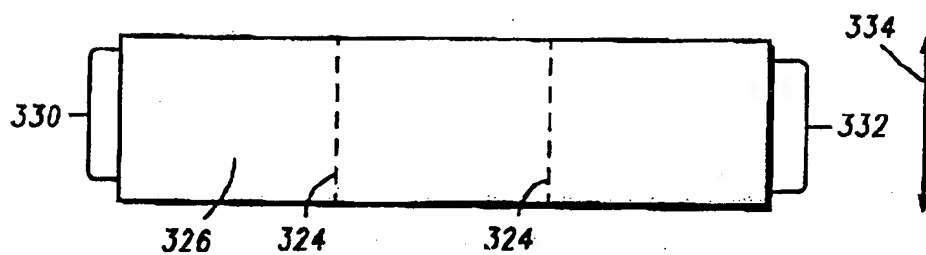


FIG. 23

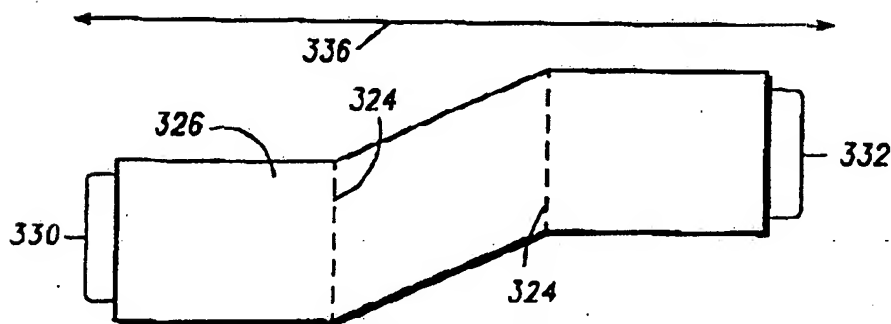


FIG. 24

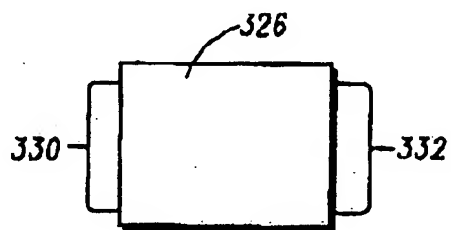


FIG. 25

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/19606

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : H04L 9/00; G06F 3/00

US CL : Please See Extra Sheet.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/335; 395/200.3, 200.33, 200.47, 200.48, 200.49, 200.57, 680, 681, 682, 683, 684; 235/380, 381, 382; 380/20, 21, 22, 23, 24, 25

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched  
APSElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
STN

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y, P	US 5,590,197 A (CHEN ET AL) 31 December 1996, See Summary on col. 3-4 and also cols. 5-6	1-10
Y, E	US 5,699,528 A (HOGAN) 16 December 1997, See Abstract and also Fig. 1	1-10
Y, P	US 5,671,279 A (ELGAMAL) 23 September 1997, Fig. 1	1-10
Y, P	US 5,677,955 A (DOGETT ET AL) 14 October 1997, Fig. 3	1-10
Y, P	BusinessCards/32 4.1, Infoworld, (31 March 1997), pp.102, Abstract	1-10
Y, P	OnSite Offering Helps Secure Transactions, Internet Week, (15 September 1997), pp.21	1-10

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	* T	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
* A		document defining the general state of the art which is not considered to be of particular relevance
* E		earlier document published on or after the international filing date
* L		document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
* O		document referring to an oral disclosure, use, exhibition or other means
* P		document published prior to the international filing date but later than the priority date claimed
	* X	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
	* Y	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
	* G	document member of the same patent family

Date of the actual completion of the international search

29 JANUARY 1998

Date of mailing of the international search report

10 MAR 1998

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Authorized officer

A. Kalbab

Telephone No. (703) 305-9667

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US97/19606

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Banking on the future Marketing Finanacial Services on the Internet, Newsletter: Multimedia & Videodisc Monitor, 01 May 1996, Vol. 14, No. 5	1-10
Y, E	US 5,640,193 A (WELLNER) 17 June 1997, Fig. 2, cols. 1-4	1-10

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/US97/19606

**A. CLASSIFICATION OF SUBJECT MATTER:**

US CL :

345/335; 395/200.3, 200.33, 200.47, 200.48, 200.49, 200.57, 680, 681, 682, 683, 684; 235/380, 381, 382; 380/20,  
21, 22, 23, 24, 25